Overview
Of
Tennessee Childhood Deaths

1997-1999

Analysis of Child Fatality Review Data

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Introduction

Any death is a traumatic event to the family and friends of the deceased, yet its inevitability is certain. Death in the latter years of life is, nevertheless, expected and accepted as part of the natural order. When it occurs to someone just starting out in life, death can be very tragic and devastating. The grief and loss of human potential associated with the death of a young person is often very heart wrenching—especially when such a death could have been avoided with proper health and safety measures. The prevention and reduction of unnecessary deaths of our younger population is recognized as a serious public health concern in Tennessee. To that end, the State of Tennessee passed legislation in 1995 known as the 'Child Fatality Review and Prevention Act of 1995'. The act created the Tennessee child fatality prevention team, a multidisciplinary group of individuals working and concerned with juvenile health and welfare issues. The team consists of both a statewide team, as well as local teams in each judicial district, charged to review and analyze all Tennessee childhood deaths of those seventeen (17) years of age or younger. It is hoped that the increased scrutiny of all childhood deaths in Tennessee will lead to a better understanding of the factors that led to them and will further guide policymakers in developing programs, procedures, and educational efforts aimed at reducing such negative consequences. A copy of the legislation creating and defining the Child Fatality Review and Prevention program can be found in Appendix A.

As the name of the program implies, the purpose of the program is two-fold. First, the child fatality prevention teams review all childhood deaths of those seventeen years of age and younger in the state. This is a very important process in understanding the causes and conditions surrounding these deaths. Mortality data from death certificates are good for simple, technical, generalized data tabulations. However, they do not provide the detail and depth of information necessary for a comprehensive understanding of the circumstances and conditions surrounding each death—especially from the public health perspective of attempting to develop or design intervening strategies to prevent or at least reduce such deaths. The local child fatality prevention teams are in a unique position due to their multidisciplinary composition, close proximity to the death event, and access to information from a variety of different sources to more fully explore, assimilate and comprehend the background and reasons for each death. The child fatality prevention teams have developed a specialized and comprehensive review/data collection form greatly enhancing the knowledge of background and contributing circumstances surrounding each death, thus providing for a more informative database for analysis and research of childhood mortality. A copy of this collection form is included in Appendix B. Secondly, in the process of reviewing each childhood death, the local teams are more keenly aware not only of the causes of childhood deaths in their communities, but also of ways that these deaths could have been prevented. Since the teams are primarily composed of persons working with and concerned with juvenile issues, they are in a position to take measures to address and rectify any health or safety problems or concerns in their area. The local child fatality prevention teams have initiated and implemented many positive programs and procedures in their jurisdictions. Some specific examples of team accomplishments can be found in the accomplishment sections of the *Child Fatalities in Tennessee* reports for each of the individual yearly reports previously published.

While the Child Fatality Review and Prevention Program has been in existence since 1995 and has produced data and annual reports from 1996 through 1999, it was felt that a three year summary of the years 1997-1999 would be most appropriate. There should be enough time and experience in working with the data for the three-year period that the data collection and analysis would be well developed and defined and pertinent to the issues at hand. The previous *Child Fatalities in Tennessee* annual reports describe in detail the conditions and circumstances surrounding the childhood deaths for that particular year. Simply aggregating and repeating that

detail, already reported, would be somewhat redundant and unnecessary and is not the purpose of this document. The intent is not so much to reveal any new data, but to reinforce, strengthen, and add structure to information previously presented. The methodological approach taken, for the State as a whole, is to examine the various manners of childhood deaths by the demographic characteristics of age, race, and gender over the three-year time period, and to note any changes that might or might not be occurring. While a linear regression on yearly trends was considered and attempted, there were simply too few data points (three) to have any reliable analysis. Statistical significance testing using chi-square contingency tables analysis of year of death by manner and cause of death and the demographic characteristics of age group, race, and gender were employed. The intent was to discern if any of the yearly differences in the number and composition of deaths by these characteristics were indeed notable rather than due to normal random variation. The emphasis is not primarily directed to describing the major manner of death categories of childhood deaths in relation to the demographic characteristics associated with them, although such relationships are described in the analysis and are part of the analysis. Rather, its thrust is to ascertain whether or not the data from three years experience with childhood death data would show any major changes or trends. The focus was on what the larger pool of three-year aggregate data would indicate in a gross sense, not in detail. Such a synopsis should help highlight and corroborate any findings of individual years and verify whether or not they are valid and consistent over time. It should also provide the opportunity to note any changes or trends that might be developing in childhood mortality that might be of concern and need to be addressed.

The childhood death statistics presented will differ somewhat from similar data published in other vital statistics reports. There are two basic reasons for this difference. First, these other reports are based upon the more technically complex, rigidly defined, mortality cause of death classification procedure known as the International Classification of Diseases (ICD) coding and classification scheme. The data here, however, is based upon the broader, more generically defined manner of death scheme, as determined by the Child Fatality Review Team, not necessarily as reported on the death certificate. While such attention to taxonomic detail and medical precision are appropriate for the more traditional mortality analysis, it was felt that emphasis on the manner of death would be more appropriate given the purpose of the Child Fatality Review Team program. The child fatality review process involves the seeking of much more information related to the background conditions of the childhood deaths than that normally found in the medically-oriented vital records death certificate data only. The direction of this analysis is to be more pragmatic than medically precise. The purpose is more than merely enumerating causes of death; rather, it is attempting to provide insight into the nature and circumstances associated with these deaths so that intervention initiatives and public policy strategies may be better directed to prevent and reduce such tragic events where possible. Secondly, obtaining such information from out-of-state events occurring to Tennessee residents is difficult, both logistically and administratively, due to confidentiality restrictions that other states may impose on such information. This data only reflects events that occurred to Tennessee residents in Tennessee. Other vital statistics reports also include data from deaths that occurred to Tennessee residents outside of Tennessee. These events are few in number and their omission from analysis should not detract from the overall findings presented by the data.

It should be further noted that in 1999, cause of death coding on death certificate data underwent a major classification change from the International Cause of Death 9th Revision scheme (ICD-9) to the International Cause of Death 10th Revision scheme (ICD-10). Unlike other cause of death revisions in the past, the change from ICD-9 to ICD-10 is much more extensive. Mortality statistics, especially with regards to trend data and analysis, will be somewhat disruptive over this transitional period, the full impact of which is not known at the

present time. However, given the non-ICD defined manner-of-death categorizations used in this report, it is felt that the taxonomic changes in 1999 cause of death data will have only a minimal effect on the outcome of the study. The major manner-of-death categories throughout all three years of the study were primarily determined by the Childhood Death Review Committees and should be invariant to ICD coding changes.
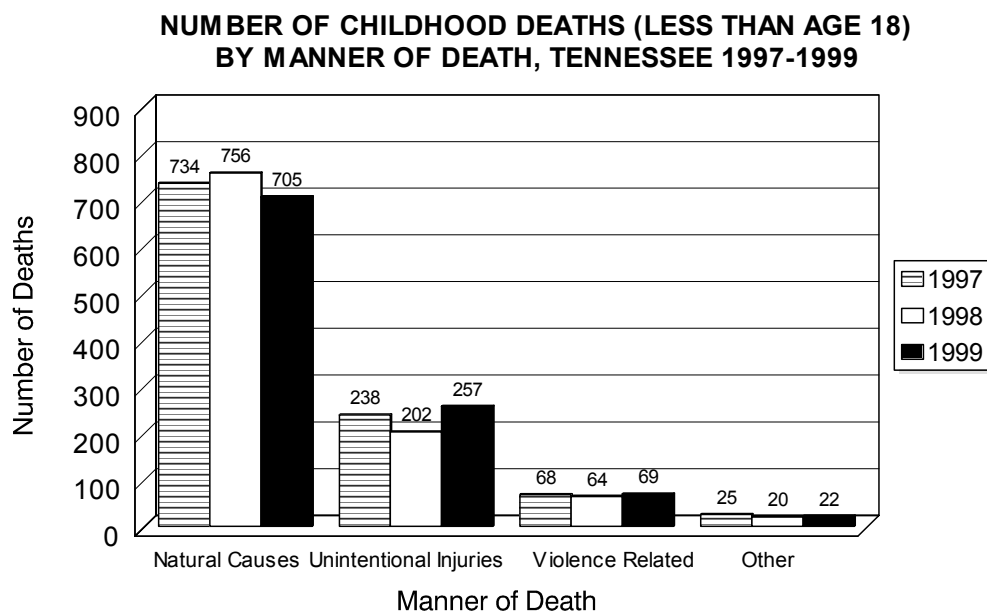
Overview of Childhood Deaths 1997-1999

The Child Fatality Review Teams, upon reviewing each cause of death to Tennessee residents under age 18, have broadly categorized all such childhood fatalities according to the following manners of death: natural causes, unintentional injuries, violence related, and other. Summary data for the period 1997-1999 are shown in Table 1 and Figure 1 (page 4). A chi-square two-way contingency table test was made on the variables of year by manner of death (chi-square=9.0828, with 6 d.f., and prob=0.1690). There appears to be no statistically significant change in the numbers and proportions of childhood deaths by either year or manner of death over the three-year period.

Similarly, three-year summary data by the age groups 1, 1-2, 3-5, 6-8, 9-11, 12-13, 14-15, and 16-17 are shown in Table 2 (page 4) and Figure 2 (page 5). A chi-square two-way contingency table test was made on the variables of year by age group(chi-square=11.9003, with 14 d.f., and prob=0.6143). Thus there also appears to be no statistically significant change in the numbers and proportions of childhood deaths by either year or age group over the three-year period.

Table 1

NUMBER OF CHILDHOOD DEATHS (LESS THAN AGE 18) BY MANNER 0F DEATH (WITH YEARLY AND THREE-YEAR AVERAGE PERCENTAGES) TENNESSEE, 1997-1999

	Manner of Death				
Years	Natural Causes	Unintentional Injuries	Violence Related	Other	Yearly Total
1997	734 (68.9%)	238 (22.3%)	68 (6.4%)	25 (2.3%)	1,065
1998	756 (72.6%)	202 (19.4%)	64 (6.1%)	20 (1.9%)	1,042
1999	705 (67.0%)	257 (24.4%)	69 (6.6%)	22 (2.1%)	1,053
1997-1999	2,195 (69.5%)	697 (22.1%)	201 (6.4%)	67 (2.1%)	3,160

Figure 1

**NUMBER OF CHILDHOOD DEATHS (LESS THAN AGE 18)
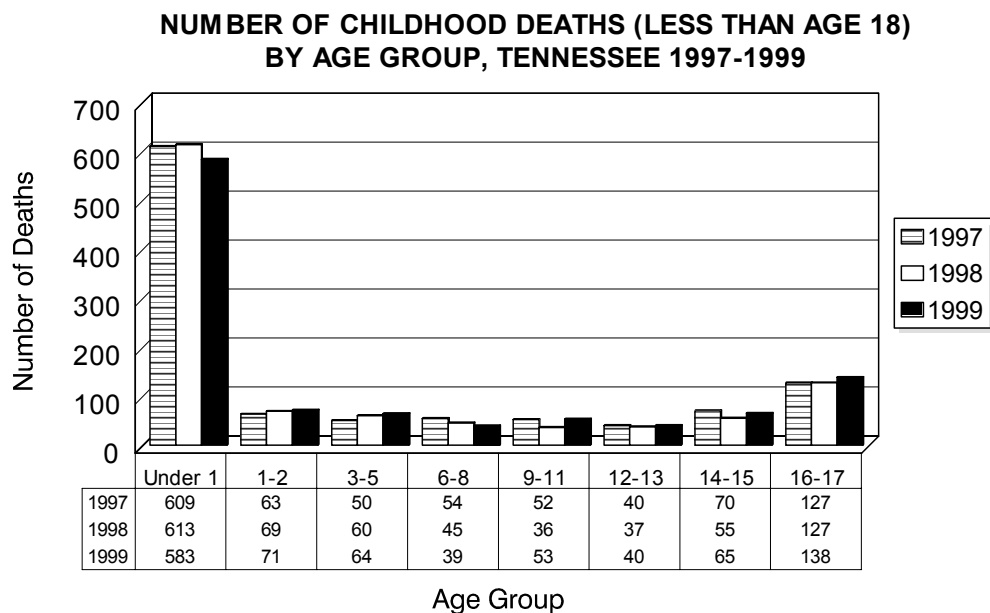BY MANNER OF DEATH, TENNESSEE 1997-1999**

Table 2

**NUMBER OF CHILDHOOD DEATHS (LESS THAN AGE 18) BY AGE GROUP
(WITH YEARLY AND THREE-YEAR AVERAGE PERCENTAGES)
TENNESSEE, 1997-1999**

	Age Group								
Years	**Under 1**	**1 - 2**	**3 - 5**	**6 - 8**	**9 - 11**	**12 -13**	**14 -15**	**16 - 17**	**Yearly Total**
1997	609 (57.2%)	63 (5.9%)	50 (4.7%)	54 (5.1%)	52 (4.9%)	40 (3.8%)	70 (6.6%)	127 (11.9%)	1,065
1998	613 (58.8%)	69 (6.6%)	60 (5.8%)	45 (4.3%)	36 (3.5%)	37 (3.6%)	55 (5.3%)	127 (12.2%)	1,042
1999	583 (55.4%)	71 (6.7%)	64 (6.1%)	39 (3.7%)	53 (5.0%)	40 (3.8%)	65 (6.2%)	138 (13.1%)	1,053
1997-1999	1,805 (57.1%)	203 (6.4%)	174 (5.5%)	138 (4.4%)	141 (4.5%)	117 (3.7%)	190 (6.0%)	392 (12.4%)	3,160

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Figure 2

NUMBER OF CHILDHOOD DEATHS (LESS THAN AGE 18)
BY AGE GROUP, TENNESSEE 1997-1999

	Under 1	1-2	3-5	6-8	9-11	12-13	14-15	16-17
1997	609	63	50	54	52	40	70	127
1998	613	69	60	45	36	37	55	127
1999	583	71	64	39	53	40	65	138

Age Group

Further chi-square contingency table tests were made on the variables year by race of decedent (chi-square=5.4008, with 4 d.f., and prob=0.2486), and on the variables year by gender of decedent (chi-square=5.5230, with 2 d.f., and prob=0.0632). Again, there appears to be no statistically significant change in the numbers and proportions of childhood deaths by year and the demographic characteristics of race and gender over the three-year period. These data are shown in Tables 3 and 4 (page 6) and Figures 3 (page 6) and 4 (page 7).
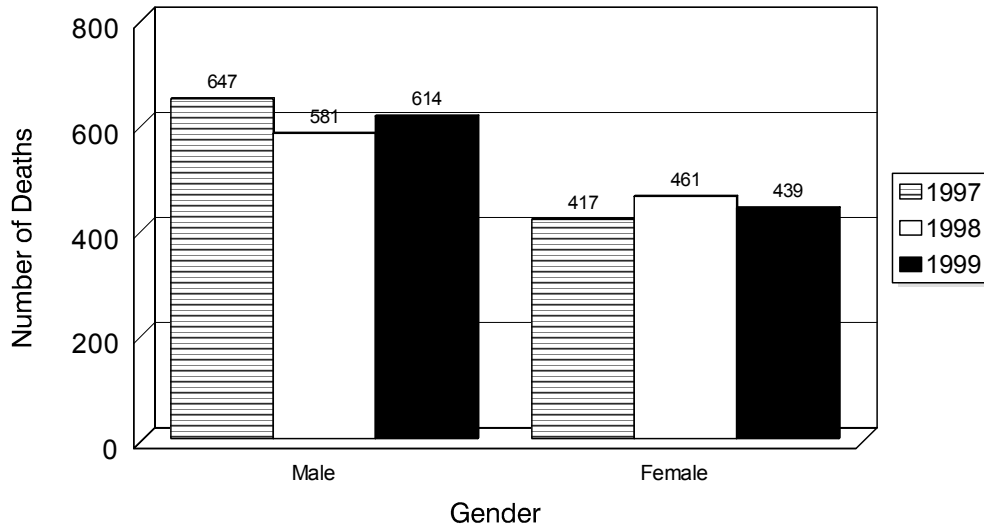
Table 3

NUMBER OF CHILDHOOD DEATHS (LESS THAN AGE 18) BY GENDER
(WITH YEARLY AND THREE-YEAR AVERAGE PERCENTAGES)
TENNESSEE, 1997-1999

| | Gender | | Yearly |
Years	Male	Female	Total
1997	647 (60.8%)	417 (39.2%)	1,064 *
1998	581 (55.8%)	461 (44.2%)	1,042
1999	614 (58.3%)	439 (41.7%)	1,053
1997-1999	1,842 (58.3%)	1,317 (41.7%)	3,159 *

*Totals do not include one death with unknown gender.

Figure 3

**NUMBER OF CHILDHOOD DEATHS (LESS THAN AGE 18)
BY GENDER, TENNESSEE 1997-1999**

Table 4

**NUMBER OF CHILDHOOD DEATHS (LESS THAN AGE 18) BY RACE
(WITH YEARLY AND THREE-YEAR AVERAGE PERCENTAGES)
TENNESSEE, 1997-1999**

| Years | Race | | | Yearly Total |
	White	Black	Other	
1997	630 (59.2%)	407 (38.2%)	28 (2.6%)	1,065
1998	660 (63.3%)	351 (33.7%)	31 (3.0%)	1,042
1999	640 (60.8%)	378 (35.9%)	35 (3.3%)	1,053
1997-1999	1,930 (61.1%)	1,136 (35.9%)	94 (3.0%)	3,160

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Figure 4

**NUMBER OF CHILDHOOD DEATHS (LESS THAN AGE 18)
BY RACE, TENNESSEE 1997-1999**
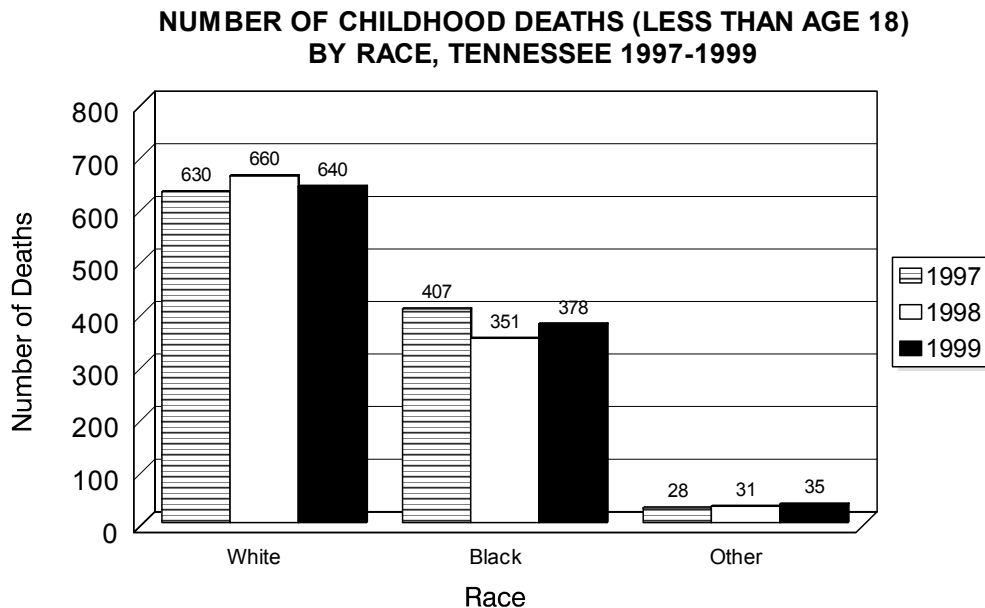
In addition to chi-square tests, linear regressions were run on the three major manners of death categories; natural causes, unintentional injuries, and violence related deaths for the years 1997-1999. However, with only the bare minimum of three data points upon which to run the regression analysis, little reliability can be placed upon this analysis. In each instance, there was a low R-square value and the confidence interval for the slope coefficient was quite large and included the null value. Thus the regression analysis further corroborates the findings of the chi-square analysis; there appears to be no statistically significant linear trend in the childhood death data over the three-year period. With the above-mentioned observations noted, a gross aggregate, demographically broad, statistical profile of childhood deaths in Tennessee over the three-year period 1997-1999 can thus be described:

As indicated in Table 1 (page 3), the number of childhood deaths in Tennessee is currently fluctuating at values that are slightly more than a thousand on an annual basis. The range over the three-year period has been between 1,065 and 1,042 with the average annual number of deaths being 1,053. The manner of death has remained fairly constant over the three-year period with natural causes constituting the majority of childhood deaths. Roughly 70 percent of all childhood deaths were attributed to this category with a yearly number of deaths between the range of 705 and 756. The next major cause of death was unintentional injuries at 22 percent of the deaths and a yearly number of deaths between the range of 202 and 257. Violence related deaths followed at 6 percent of the deaths with the yearly range 64 and 69. The composition or distribution of childhood deaths in Tennessee by manner of death is a very important factor for consideration in developing public health strategies to prevent or reduce these deaths. The nature and background of contributing factors surrounding these manners of death are somewhat different from one another. A different intervention approach will be required in any successful program or programs to reduce these deaths. This composition or distribution poses somewhat of a paradox in addressing the problem of childhood deaths. The manner of death which composes the largest number of childhood deaths, and hence where the most progress in reducing these deaths could be made, is natural causes. It is, however, to a large degree dependant on the nature of the 'human condition' and the limitations of our medical and scientific advancements at this point in time. In contrast, the manner of death which, theoretically, is completely avoidable and

which has the greatest potential for intervention and reduction, composes the smallest number of childhood deaths. Policymakers need to keep this perspective in mind as they address and allocate resources to these issues.

Examining childhood deaths by age group indicates that the majority of deaths, 57 percent, occurs to infants under 1 year of age. These deaths are highly correlated to natural causes as will be discussed in more detail in the following section. The number and percentage of deaths then drop throughout early childhood until early adolescence, when they start to increase in the unintentional injuries and violence manner of death categories. The latter childhood death age category, 16-17 years of age, has the second highest number and percentage of all childhood deaths, between 127 and 138 annual deaths or 12 percent of all childhood deaths. Gender differences in the distribution of total deaths on a yearly basis have varied around 58 percent male and 42 percent female. Racial differences have run around 61 percent white and 36 percent black on a yearly basis. However, this is based upon the total number of deaths and does not account for the differences in the racial composition of the population at risk and does not give a complete and accurate depiction of the intensity of the difference due to this demographic factor. Childhood deaths vary greatly, both by number and intensity, according to the manner of death and the demographic characteristics of age group, gender, and race. A more detailed description of the interrelationships of these characteristics should provide for a better understanding of the overall problem of childhood deaths in Tennessee. The following sections will examine these relationships by these demographic characteristics in more detail.

Deaths Due to Natural Causes

As previously indicated, deaths due to natural causes, as defined by the Child Fatality Review Team, was the leading cause of death for all children 0-17 in Tennessee over the time period 1997-1999. This constituted roughly 70 percent of all childhood deaths included in this report. The Child Fatality Review Team further sub-categorized all natural cause deaths according to illness, prematurity, and sudden infant death syndrome (SIDS). Summary data for the three-year period are shown in Table 5 and Figure 5 (page 9). In a manner similar to the analysis above, deaths due to natural causes were further analyzed by these sub-categories according to the chi-square two-way contingency tables as was previously done. The results of these analyses are as follows: for year by causes of natural causes, (chi-square=4.3500, with 4 d.f., and prob=0.3607); for year by age group for natural causes, (chi-square=5.5059,with 14 d.f., and prob=0.9775); for year by gender for natural causes (chi-square=3.6566 with 2 d.f., and prob=0.1607); and for year by race (chi-square=4.1817, with 4 d.f., and prob=0.3820). There is no significant yearly difference by the specific causes of natural causes childhood deaths nor is there any statistically significant yearly differences in the age distribution, gender, and race of these deaths. It can be concluded that the cause of death and demographic childhood mortality patterns observed for natural causes for one year during the three-year period are very similar to the patterns observed during any other year. The distribution of deaths due to natural causes has likewise reached a 'steady-state' condition. The aggregate three year summary data for natural causes simply reinforces the discussions presented in each of the annual reports.

For childhood deaths due to natural causes, the majority of deaths (45 percent) are due to illness. This is closely followed by deaths due to prematurity with 43 percent of the deaths. Sudden Infant Death Syndrome composes approximately 11 percent of the deaths. More male children (55 percent) than female children (45 percent) died of natural causes. Summary data for 1997-1999 are shown in Table 6 and Figure 6 (page 10). While numerically, more white children (57 percent) than black (39 percent) and other races (4 percent) died or natural causes, these
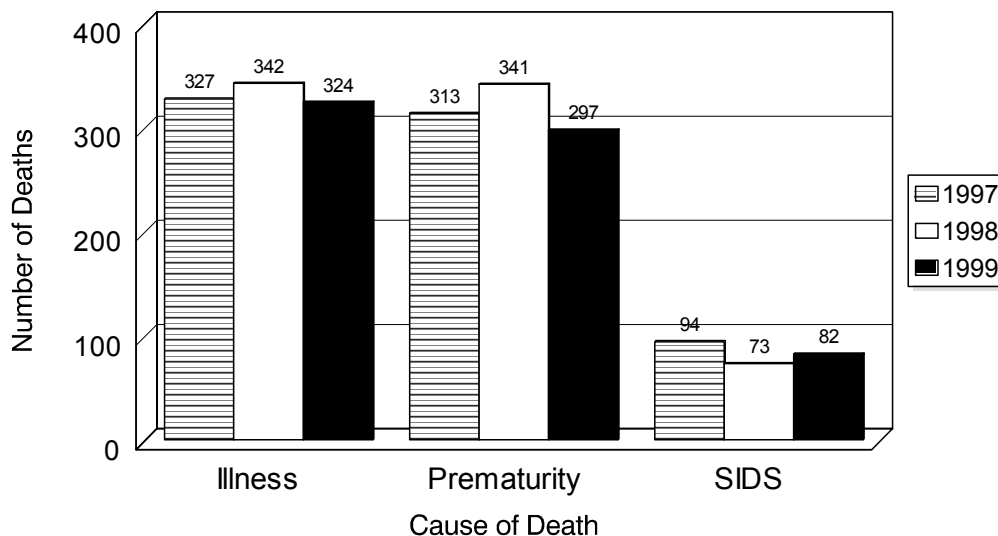
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Table 5

**NUMBER OF CHILDHOOD DEATHS (LESS THAN AGE 18) BY ILLNESS
PREMATURITY AND SIDS (WITH YEARLY AND THREE-YEAR
AVERAGE PERCENTAGES) TENNESSEE, 1997-1999**

	Cause of Death			
Years	Illness	Prematurity	SIDS	Yearly Total
1997	327 (44.6%)	313 (42.6%)	94 (12.8%)	734
1998	342 (45.2%)	341 (45.1%)	73 (9.7%)	756
1999	324 (46.1%)	297 (42.3%)	82 (11.7%)	703
1997-1999	993 (45.3%)	951 (43.4%)	249 (11.4%)	2,193

percentages belie the underlying proportional racial differences in the population at risk. Summary data for 1997-1999 are shown in Table 7 and Figure 7 (page 11). White children under age 18 comprise about 75 percent of that age cohort while black children comprise about 21 percent of that age cohort. Adjusting for the racial distribution of the population at risk, one finds that deaths due to natural causes for black childhood deaths are proportionally 2.5 times that of white childhood deaths.

Figure 5
**NUMBER OF CHILDHOOD DEATHS (LESS THAN AGE 18)
BY ILLNESS, PREMATURITY, AND SIDS
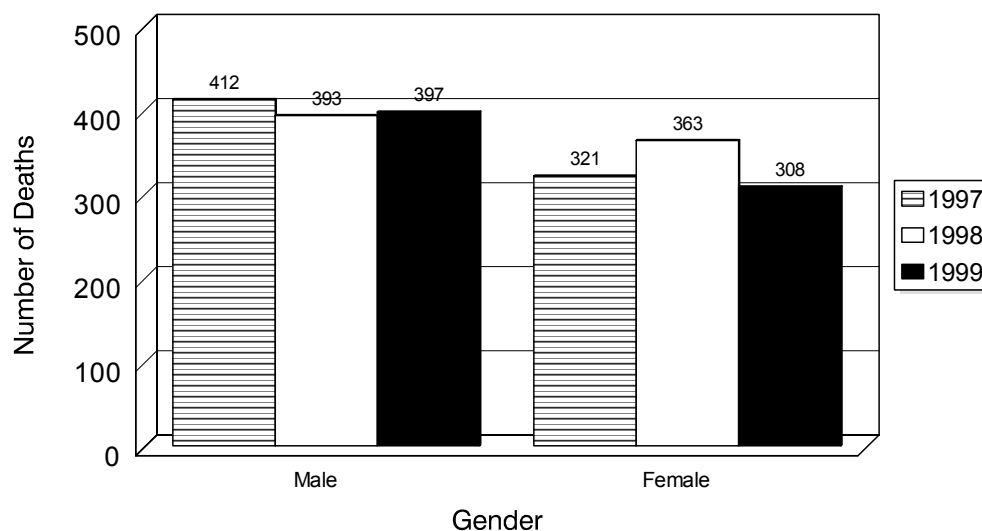TENNESSEE 1997-1999**

Table 6

NUMBER OF CHILDHOOD DEATHS (LESS THAN AGE 18) DUE TO NATURAL CAUSES, BY GENDER (WITH YEARLY AND THREE-YEAR AVERAGE PERCENTAGES) TENNESSEE, 1997-1999

| Years | Gender | | Yearly Total |
	Male	Female	
1997	412 (56.2%)	321 (43.8%)	733 *
1998	393 (52.0%)	363 (48.0%)	756
1999	397 (56.3%)	308 (43.7%)	705
1997-1999	1,202 (54.8%)	992 (45.2%)	2,194 *

*Totals do not include one death with unknown gender.

Figure 6

NUMBER OF CHILDHOOD DEATHS (LESS THAN AGE 18) DUE TO NATURAL CAUSES, BY GENDER, TENNESSEE 1997-1999
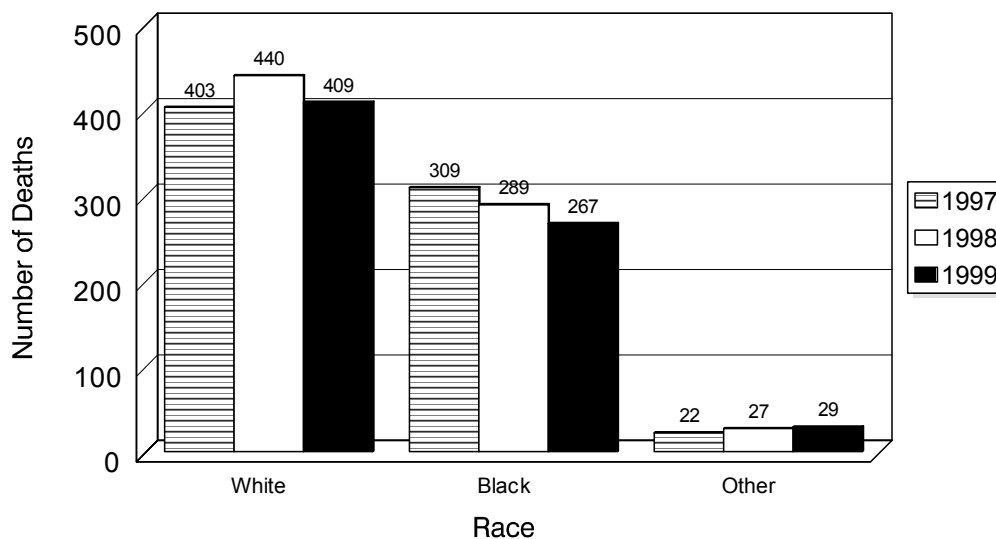

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Table 7

**NUMBER OF CHILDHOOD DEATHS (LESS THAN AGE 18) DUE TO
NATURAL CAUSES BY RACE (WITH YEARLY AND THREE-YEAR
AVERAGE PERCENTAGES) TENNESSEE, 1997-1999**

| Years | Race | | | Yearly Total |
	White	Black	Other	
1997	403 (54.9%)	309 (42.1%)	22 (3.0%)	734
1998	440 (58.2%)	289 (38.2%)	27 (3.6%)	756
1999	409 (58.0%)	267 (37.9%)	29 (4.1%)	705
1997-1999	1,252 (57.0%)	865 (39.4%)	78 (3.6%)	2,195

Figure 7

**NUMBER OF CHILDHOOD DEATHS (LESS THAN AGE 18) DUE TO
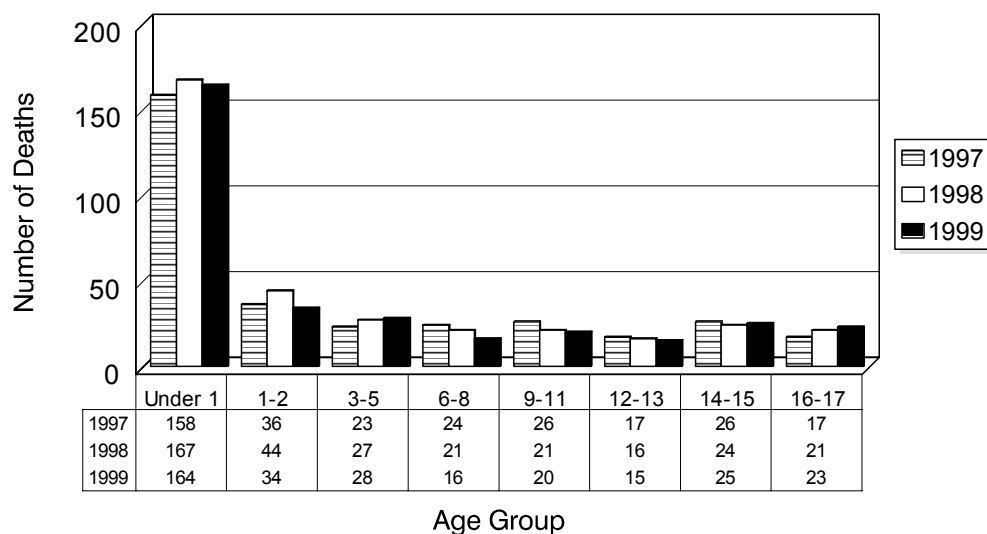NATURAL CAUSES, BY RACE, TENNESSEE 1997-1999**

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Since deaths due to prematurity and SIDS are correlated to deaths under one year of age, analysis of these causes by age groups is trivial. Deaths due to natural causes--illnesses, however, can be so described. Table 8 and Figure 8 show the distribution deaths due to natural causes--illnesses by year and age group. A chi-square two-way contingency table analysis was also run

Table 8

**NUMBER OF CHILDHOOD DEATHS (LESS THAN AGE 18)
DUE TO NATURAL CAUSES: ILLNESSES, BY AGE GROUP
(WITH YEARLY AND THREE-YEAR AVERAGE PERCENTAGES)
TENNESSEE, 1997-1999**

	Age Group								
Years	Under 1	1 - 2	3 - 5	6 - 8	9 - 11	12 -13	14 -15	16 - 17	Yearly Total
1997	158 (48.3%)	36 (11.0%)	23 (7.0%)	24 (7.3%)	26 (8.0%)	17 (5.2%)	26 (8.0%)	17 (5.2%)	327
1998	167 (49.0%)	44 (12.9%)	27 (7.9%)	21 (6.2%)	21 (6.2%)	16 (4.7%)	24 (7.0%)	21 (6.2%)	341
1999	164 (50.5%)	34 (10.5%)	28 (8.6%)	16 (4.9%)	20 (6.2%)	15 (4.6%)	25 (7.7%)	23 (7.1%)	325
1997-1999	489 (49.2%)	114 (11.5%)	78 (7.9%)	61 (6.1%)	67 (6.7%)	48 (4.8%)	75 (7.6%)	61 (6.1%)	993

Figure 8
**NUMBER OF CHILDHOOD DEATHS (LESS THAN AGE 18)
DUE TO NATURAL CAUSES: ILLNESSES
BY AGE GROUP, TENNESSEE 1997-1999**

	Under 1	1-2	3-5	6-8	9-11	12-13	14-15	16-17
1997	158	36	23	24	26	17	26	17
1998	167	44	27	21	21	16	24	21
1999	164	34	28	16	20	15	25	23

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on these data (chi-square=5.5059 with 14 d.f., and prob=0.9775). Once again, there is no yearly statistically significant difference in the distribution of childhood deaths due to natural causes-- illnesses for the age groups used in this document. Almost half (49 percent) of the childhood deaths in this category occurred to infants less than one year of age, followed by children age 1-2 with 11 percent of the deaths. On a more detailed level of type of illness or condition, data already presented in previous annual reports for the three-year period indicate that the leading cause of death for illnesses was congenital anomalies with between 32 and 36 percent of illness deaths. Cancer follows with 12 to 13 percent of the deaths. Next was diseases originating in the perinatal period with 11 to 14 percent of the deaths and diseases of the respiratory system between 9 and 11 percent of the deaths.

Deaths due to natural causes--prematurity has been defined as the death of an infant born before 37 completed weeks of pregnancy. It was the second leading cause of childhood death for deaths due to natural causes over the time period 1997-1999. Prematurity deaths accounted for 948 childhood deaths or 43 percent of deaths due to natural causes and 30 percent of all childhood deaths during this time. Prematurity deaths can further be subdivided into two additional subcategories; those with gestational age 22 weeks or less and those with gestational age 23 to 37 weeks. Table 9 and Figure 9 (page 14) show the number of childhood deaths due to these two sub-classifications of prematurity over the three-year period. A chi-square two-way contingency table analysis was run on these data (chi-square=8.0508 with 2 d.f., and prob=0.0179), with a statistically significant result at the 0.05 level of significance. An inconsistent relationship between the extremely premature and moderately premature infant deaths was indicated over the three-year period. A closer examination of the data reveals that in 1997, of the 313 deaths due to prematurity, 96 were 22 weeks gestation or less while 217 were between 23 and 37 weeks

Table 9

**NUMBER OF CHILDHOOD DEATHS DUE TO PREMATURITY BY
GESTATIONAL AGE (WITH YEARLY AND THREE-YEAR
AVERAGE PERCENTAGES) TENNESSEE, 1997-1999**

Years	Gestational Age Less Than 22 Weeks	Gestational Age 23 to 37 Weeks	Yearly Total
1997	96 (30.7%)	217 (69.3%)	313
1998	141 (41.4%)	200 (58.7%)	341
1999	107 (36.4%)	187 (63.6%)	294
1997-1999	344 (36.3%)	604 (63.7%)	948

gestation. In 1998, this relationship was 141 of 22 weeks gestation or less and 200 between 23 and 37 weeks gestation; and in 1999, it was 107 of 22 weeks or less and 187 between 23 and 37 weeks gestation. The statistically significant difference is most likely the result of the wide disparity in the difference in the two categories found in the 1997 data. No yearly trend was noted since there appears to be fluctuations in the less than 22 weeks gestation category as well as in the total of the categories combined. Weeks gestations is known to be a difficult measure in health statistics to accurately assess. The statistically significant result found here is most likely spurious in nature and not reflective of any true change or trend. The result should be carefully monitored in any subsequent years' analysis. Since the categorization of gestational age by extreme and moderate prematurity appears to be somewhat inconsistent over the three-year period, further discussion of prematurity will pool these factors in the analysis of the other demographic factors of interest.

Figure 9

**NUMBER OF CHILDHOOD DEATHS DUE TO PREMATURITY
BY GESTATIONAL AGE, TENNESSEE 1997-1999**
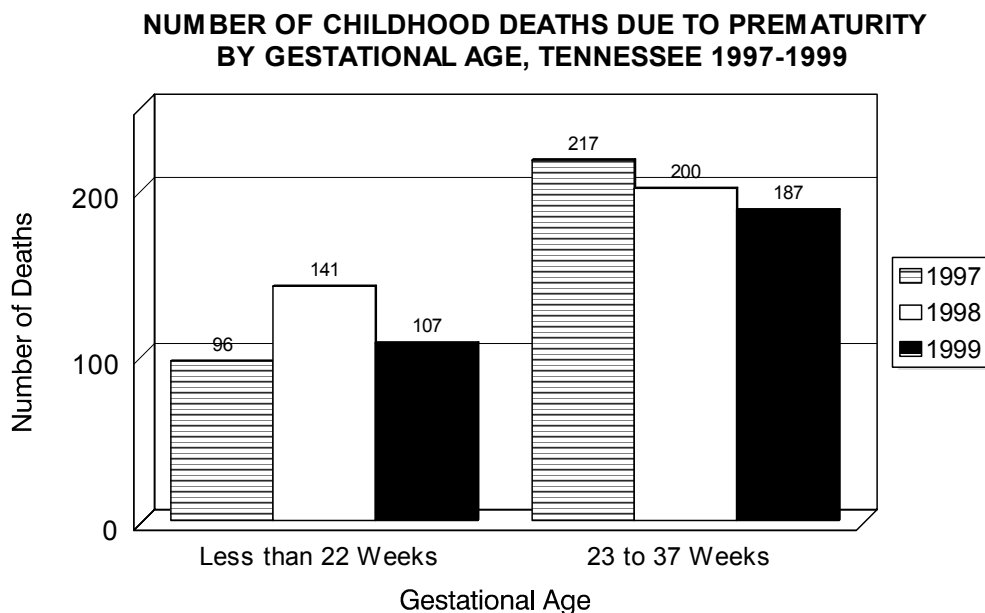
The number of childhood prematurity deaths by race for the time period 1997-1999 are shown in Table 10 (page 15) and Figure 10 (page 16). A chi-square two-way contingency table analysis was run on these data (chi-square=6.1071 with 4 d.f., and prob=0.1913), with a non-statistically significant result indicating that there is no discernable yearly trend in the racial distribution of childhood deaths due to prematurity. Table 11 (page 16) and Figure 11 (page 17) show the number of childhood prematurity deaths by gender for the time period 1997-1999. A chi-square two-way contingency table analysis was run on these data (chi-square=4.1359 with 2 d.f., and prob=0.1264). The test indicates that there is no apparent yearly trend in the distribution of childhood deaths by gender. Table 12 (page 17) and Figure 12 (page 18) show the number of childhood prematurity deaths by age at death for the time period 1997-1999. A chi-square two-way contingency table analysis was run on these data (chi-square=2.6903 with 4 d.f., and prob=0.6109). The test indicates that there is no yearly trend in the distribution of childhood deaths by age at death.

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With the exception of the finding that measurement and categorization of premature deaths by extreme and moderate prematurity was somewhat volatile over the three-year period, the results of the findings from the childhood death reports for deaths due to prematurity are only further enhanced. That is, deaths due to prematurity occurred very early in life, the majority, 491 (52 percent), were during the first day of life (within 24 hours of birth), followed by 354 (37 percent) between 1 and 28 days of life. Male infants, 511 (54 percent), were more likely to die from prematurity that female infants, 437 (46 percent). Even while numerically there were more black infant, 469 (49 percent), than white infant, 438 (46 percent), prematurity deaths, since the ratio of births of white infants to black infants is about 3.5 to 1, black infant deaths due to prematurity are proportionally even much greater than those of white infants. Black infants are about 3.8 times as likely to die from prematurity than their white counterparts. As previously discussed in the yearly childhood death reports, deaths due to prematurity for mothers less than age 17 were proportionally about 2.2 to 2.8 times greater than for mothers 18 years of age and older. While the medical and physiological factors underlying short gestation and premature births are beyond the scope of this study, it is realized that there are certain public health endeavors that can address this problem in a positive way. Programs that promote early prenatal health care, good nutrition, avoidance of tobacco, alcohol and other harmful substances, as well as reducing the number of adolescent births should hopefully contribute to lessening the problem of childhood deaths due to prematurity.

Table 10

NUMBER OF CHILDHOOD DEATHS DUE TO PREMATURITY BY RACE
(WITH YEARLY AND THREE-YEAR AVERAGE PERCENTAGES)
TENNESSEE, 1997-1999

	Race			Yearly
Years	White	Black	Other	Total
1997	152 (48.6%)	153 (48.9%)	8 (2.6%)	313
1998	156 (45.8%)	171 (50.2%)	14 (4.1%)	341
1999	130 (44.2%)	145 (49.3%)	19 (6.5%)	294
1997-1999	438 (46.2%)	469 (49.5%)	41 (4.3%)	948

Figure 10

**NUMBER OF CHILDHOOD DEATHS DUE TO PREMATURITY
BY RACE, TENNESSEE 1997-1999**
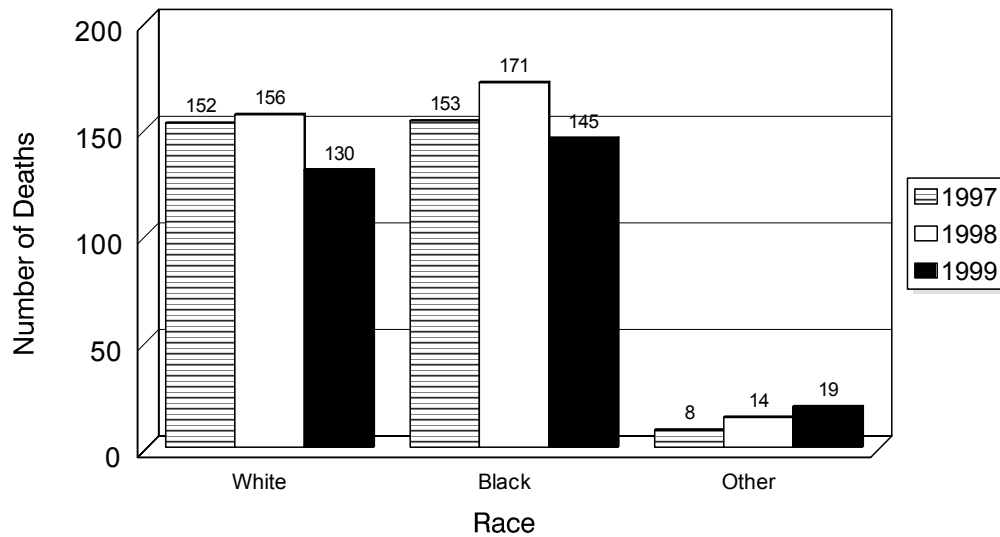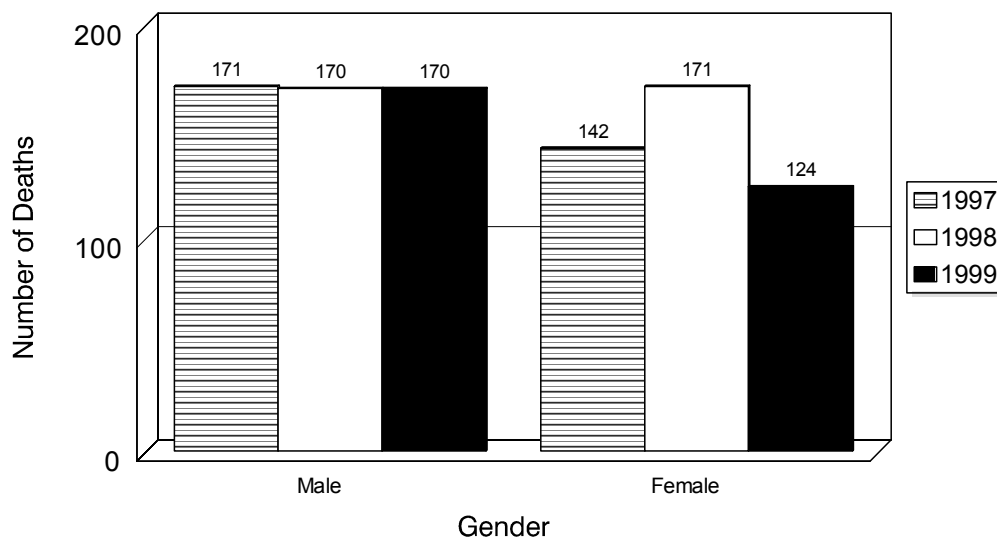

Table 11

**NUMBER OF CHILDHOOD DEATHS DUE TO PREMATURITY BY GENDER
(WITH YEARLY AND THREE-YEAR AVERAGE PERCENTAGES)
TENNESSEE, 1997-1999**

| | Gender | | Yearly |
Years	Male	Female	Total
1997	171 (54.6%)	142 (45.4%)	313
1998	170 (49.9%)	171 (50.2%)	341
1999	170 (57.8%)	124 (42.2%)	294
1997-1999	511 (53.9%)	437 (46.1%)	948

*Totals do not include one death with unknown gender.

Figure 11

**NUMBER OF CHILDHOOD DEATHS DUE TO PREMATURITY BY GENDER, TENNESSEE 1997-1999**

Table 12

NUMBER OF CHILDHOOD DEATHS DUE TO PREMATURITY, BY AGE AT DEATH (WITH YEARLY AND THREE-YEAR AVERAGE PERCENTAGES) TENNESSEE, 1997-1999

	Age at Death			
Years	**Less than 1 day**	**1-28 days**	**Greater than 29 days**	**Yearly Total**
1997	153 (48.9%)	120 (38.3%)	40 (12.8%)	313
1998	183 (53.7%)	126 (37.0%)	32 (9.4%)	341
1999	155 (52.7%)	108 (36.7%)	31 (10.5%)	294
1997-1999	491 (51.8%)	354 (37.3%)	103 (10.9%)	948

Figure 12

NUMBER OF CHILDHOOD DEATHS DUE TO PREMATURITY
BY AGE AT DEATH, TENNESSEE 1997-1999
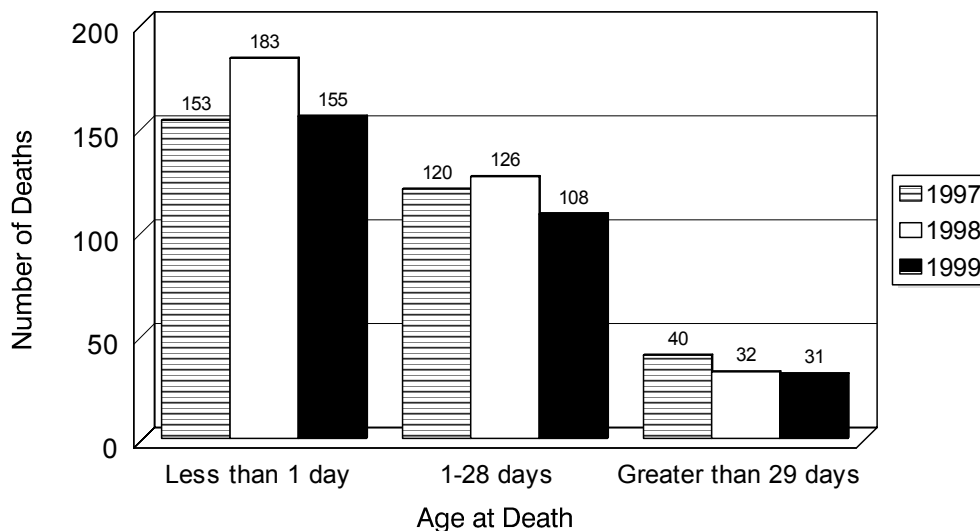
Sudden Infant Death Syndrome, more commonly referred to as SIDS, as defined by an expert panel convened by the National Institute of Child Health and Human Development is the 'sudden death of an infant under 1 year of age which remains unexplained after a thorough case investigation, including performance of a complete autopsy, examination of the death scene, and review of the clinical history.' In Tennessee an autopsy is not required before determining SIDS as a cause of death. During the three-year time period 1997-1999, the Child Fatality Review Teams identified 249 deaths due to SIDS on the database. Table 13 and Figure 13 (page 19) show the number and distribution of SIDS deaths by year and gender. A chi-square two-way contingency table analysis was run on these data (chi-square=0.5552 with 2 d.f., and prob=0.7576). This indicates that there appears to be no yearly trend in the distribution of SIDS deaths by gender. Table 14 and Figure 14 (page 20) show the number and distribution of SIDS deaths by year and race. A chi-square two way contingency table analysis was run on the data (chi-square=5.9540 with 4 d.f., and prob=0.2026). This indicates that there appears to be no yearly trend in the distribution of SIDS deaths by race. Table 15 and Figure 15 (page 21) show the number and distribution of SIDS deaths by age groups less than one year of age. A chi-square two way contingency table analysis was run on the data (chi-square=14.6223 with 12 d.f., and prob=0.2627). This indicates that there appears to be no yearly trend in the distribution of SIDS deaths by age group less than one year. It can be concluded that the problem of childhood deaths due to SIDS, demographic wise, has remained fairly constant over the time period 1997-1999. The yearly average of SIDS deaths is around 83 deaths per year. More male infants, 141 (57 percent), than female infants, 107 (43 percent), died from SIDS. While numerically more white infants, 144 (58 percent), than black infants 100 (40 percent), died from SIDS, proportionally black infants had a greater risk of dying from SIDS. Black infants are about 2.5 times as likely to die from SIDS as their white counterparts. And finally, the risk of dying from SIDS was the greatest in the second through third months of life and began to diminish thereafter. SIDS continues to remain a phenomenon whose underlying cause is still indeterminable and difficult to comprehend.
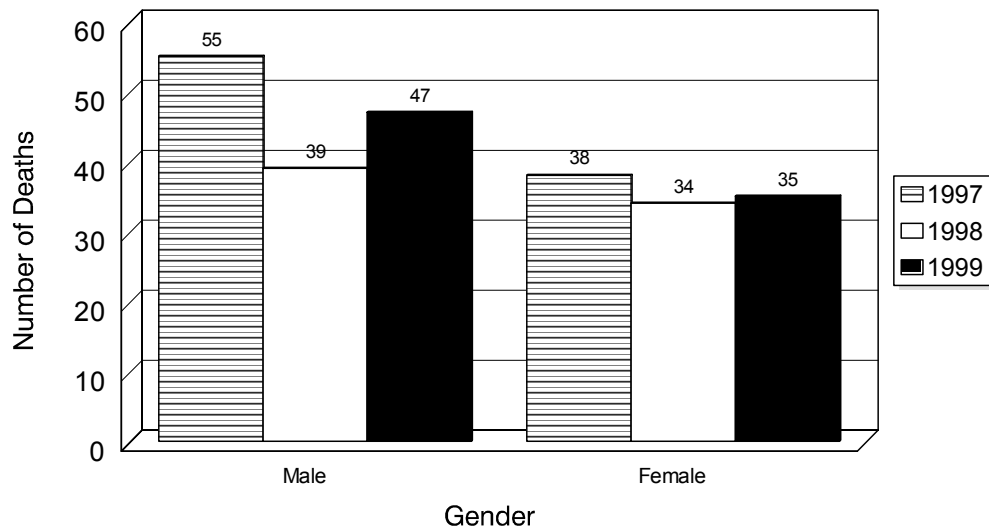
Table 13

**NUMBER OF CHILDHOOD DEATHS DUE TO NATURAL CAUSES
SUDDEN INFANT DEATH SYNDROME, BY YEAR AND GENDER
(WITH YEARLY AND THREE-YEAR AVERAGE PERCENTAGES)
TENNESSEE, 1997-1999**

	Gender		Yearly Total
Years	Male	Female	
1997	55 (59.1%)	38 (40.9%)	93 *
1998	39 (53.4%)	34 (46.6%)	73
1999	47 (57.3%)	35 (42.7%)	82
1997-1999	141 (56.9%)	107 (43.1%)	248 *

*Total is missing one death with gender unknown.

Figure 13

**NUMBER OF CHILDHOOD DEATHS DUE TO NATURAL CAUSES
SUDDEN INFANT DEATH SYNDROME, BY GENDER
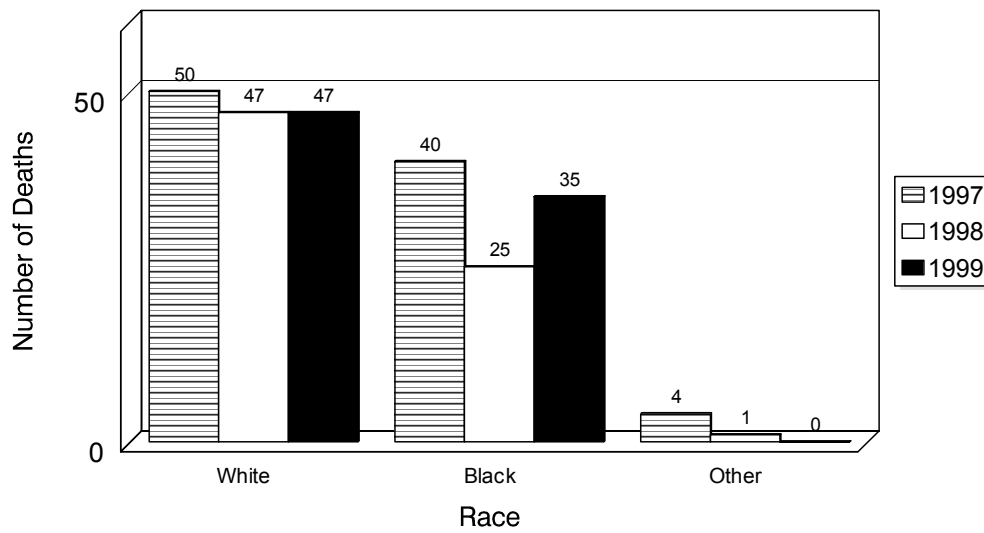TENNESSEE 1997-1999**

Table 14

**NUMBER OF CHILDHOOD DEATHS DUE TO NATURAL CAUSES
SUDDEN INFANT DEATH SYNDROME, BY YEAR AND RACE
(WITH YEARLY AND THREE-YEAR AVERAGE PERCENTAGES)
TENNESSEE, 1997-1999**

| Years | Race | | | Yearly Total |
	White	Black	Other	
1997	50 (53.2%)	40 (42.6%)	4 (4.3%)	94
1998	47 (64.4%)	25 (34.3%)	1 (1.4%)	73
1999	47 (57.3%)	35 (42.7%)	0 (0.0%)	82
1997-1999	144 (57.8%)	100 (40.2%)	5 (2.0%)	249

Figure 14

**NUMBER OF CHILDHOOD DEATHS DUE TO NATURAL CAUSE
SUDDEN INFANT DEATH SYNDROME, BY RACE
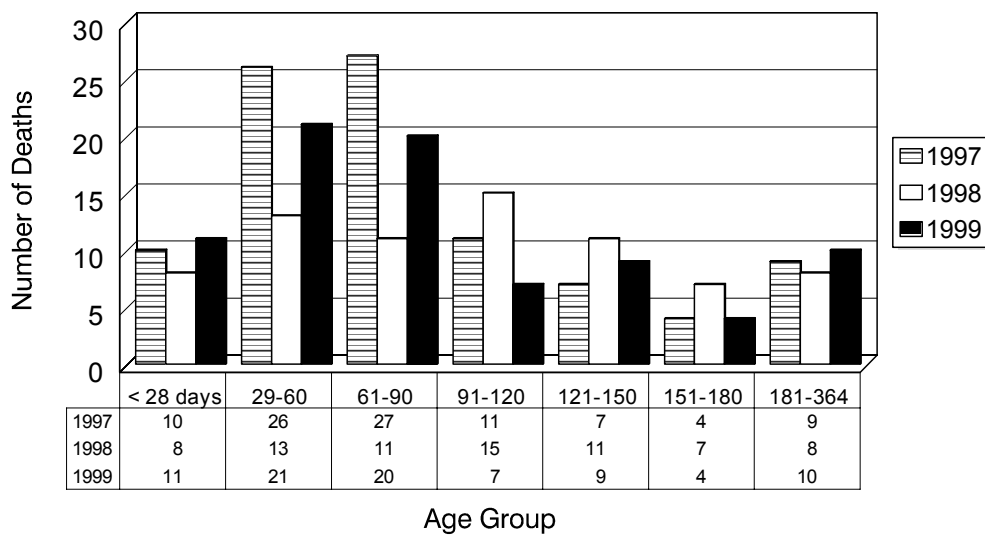TENNESSEE 1997-1999**

20

Table 15

**NUMBER OF CHILDHOOD DEATHS DUE TO NATURAL CAUSES, SUDDEN
INFANT DEATH SYNDROME, BY YEAR AND AGE GROUP LESS THAN ONE
(WITH YEARLY AND THREE-YEAR AVERAGE PERCENTAGES)
TENNESSEE, 1997-1999**

| Years | Age Group | | | | | | | Yearly Total |
	Under 28 days	29 - 60	61 - 90	91 - 120	121 - 150	151 -180	181 -364	
1997	10 (10.6%)	26 (27.7%)	27 (28.7%)	11 (11.7%)	7 (7.5%)	4 (4.3%)	9 (9.6%)	94
1998	8 (11.0%)	13 (17.8%)	11 (15.1%)	15 (20.6%)	11 (15.1%)	7 (9.6%)	8 (11.0%)	73
1999	11 (13.4%)	21 (25.6%)	20 (24.4%)	7 (8.5%)	9 (11.0%)	4 (4.9%)	10 (12.2%)	82
1997-1999	29 (11.6%)	60 (24.1%)	58 (23.3%)	33 (13.3%)	27 (10.8%)	15 (6.0%)	27 (10.8%)	249

Figure 15

**NUMBER OF CHILDHOOD DEATHS DUE TO NATURAL CAUSES, SUDDEN
INFANT DEATH SYNDROME, BY AGE GROUP LESS THAN ONE
TENNESSEE 1997-1999**

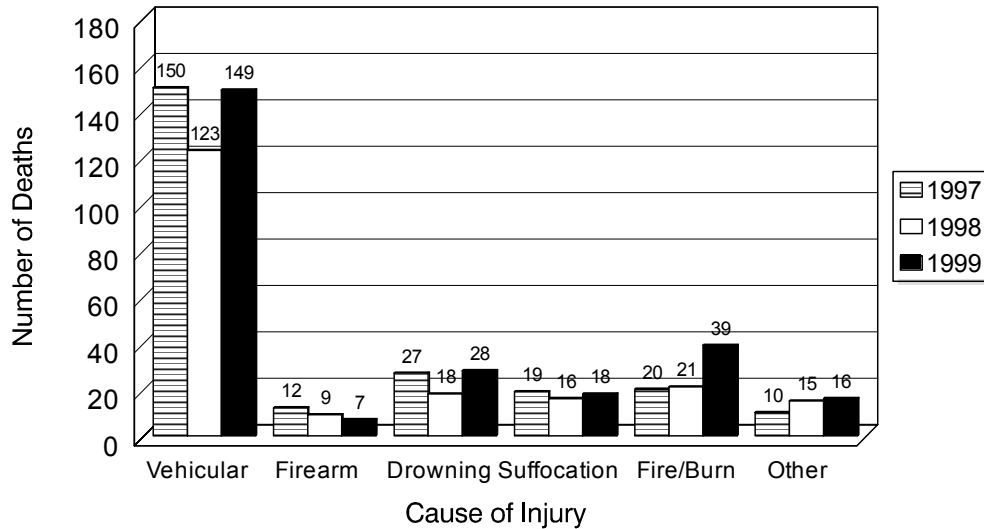|	< 28 days	29-60	61-90	91-120	121-150	151-180	181-364
1997	10	26	27	11	7	4	9
1998	8	13	11	15	11	7	8
1999	11	21	20	7	9	4	10

Age Group

Deaths Due to Unintentional Injuries

There were 697 childhood deaths less than age 18 due to unintentional injuries during the three-year time period 1997-1999. This constitutes a yearly average of around 232 fatalities per year. Table 16 and Figure 16 (page 23) show the number and distribution of childhood unintentional deaths by year and cause of injury over the three-year period. A chi-square two-way contingency table analysis was run on these data (chi-square=10.4344 with 10 d.f., and prob=0.4032). This indicates that there appears to be no yearly trend in the number and distribution of unintentional injuries by cause of injury over the three-year period. Table 17 (page 23) and Figure 17 (page 24) show the number and distribution of childhood unintentional deaths by year and age group over the three-year period. A chi-square two-way contingency table analysis was run on these data (chi-square=6.1760 with 14 d.f., and prob=0.9619). This also indicates that there appears to be no yearly trend in the number and distribution of unintentional injuries by age group over the three-year period. Table 18 (page 24) and Figure 18 (page 25) show the number and distribution of childhood unintentional deaths by year and race of decedent over the three-year period. A chi-square two-way contingency table analysis was run on these data (chi-square=7.2384 with 4 d.f., and prob=0.1238). This further indicates that there appears to be no yearly trend in the number and distribution of unintentional injuries by age group over the

Table 16

NUMBER OF CHILDHOOD DEATHS (LESS THAN AGE 18) DUE TO UNINTENTIONAL INJURIES, BY YEAR AND CAUSE OF INJURY (WITH YEARLY AND THREE-YEAR AVERAGE PERCENTAGES) TENNESSEE, 1997-1999

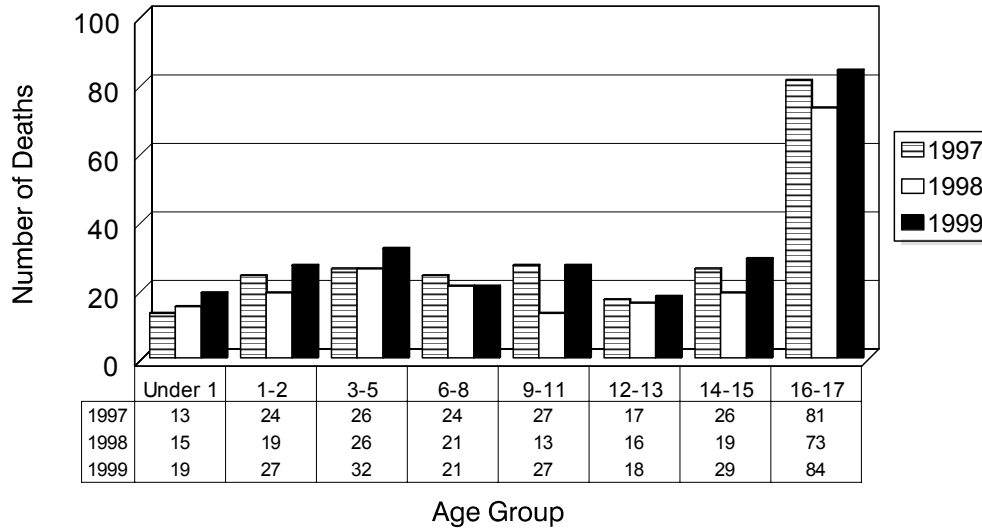| Years | Cause of Injury | | | | | | Yearly Total |
	Vehicular	Firearm	Drowing	Suffocation	Fire/Burn	Other	
1997	150 (63.0%)	12 (5.0%)	27 (11.3%)	19 (8.0%)	20 (8.4%)	10 (4.2%)	238
1998	123 (60.9%)	9 (4.5%)	18 (8.9%)	16 (7.9%)	21 (10.4%)	15 (7.4%)	202
1999	149 (58.0%)	7 (2.7%)	28 (10.9%)	18 (7.0%)	39 (15.2%)	16 (6.2%)	257
1997-1999	422 (60.5%)	28 (4.0%)	73 (10.5%)	53 (7.6%)	80 (11.5%)	41 (5.9%)	697

Figure 16

**NUMBER OF CHILDHOOD DEATHS (LESS THAN AGE 18)
DUE TO UNINTENTIONAL INJURIES, BY YEAR AND
CAUSE OF INJURY, TENNESSEE 1997-1999**

Table 17

**NUMBER OF CHILDHOOD DEATHS (LESS THAN AGE 18) DUE
TO UNINTENTIONAL INJURIES, BY YEAR AND AGE GROUP
(WITH YEARLY AND THREE-YEAR AVERAGE PERCENTAGES)
TENNESSEE, 1997-1999**

|	Age Group								Yearly Total
Years	Under 1	1 - 2	3 - 5	6 - 8	9 - 11	12 -13	14 -15	16 - 17	
1997	13 (5.5%)	24 (10.1%)	26 (10.9%)	24 (10.1%)	27 (11.3%)	17 (7.1%)	26 (10.9%)	81 (34.0%)	238
1998	15 (7.4%)	19 (9.4%)	26 (12.9%)	21 (10.4%)	13 (6.4%)	16 (7.9%)	19 (9.4%)	73 (36.1%)	202
1999	19 (7.4%)	27 (10.5%)	32 (12.5%)	21 (8.2%)	27 (10.5%)	18 (7.0%)	29 (11.3%)	84 (32.7%)	257
1997-1999	47 (6.7%)	70 (10.0%)	84 (12.1%)	66 (9.5%)	67 (9.6%)	51 (7.3%)	74 (10.6%)	238 (34.1%)	697

Figure 17

**NUMBER OF CHILDHOOD DEATHS (LESS THAN AGE 18) DUE
TO UNINTENTIONAL INJURIES, BY YEAR AND AGE GROUP
TENNESSEE, 1997-1999**

	Under 1	1-2	3-5	6-8	9-11	12-13	14-15	16-17
1997	13	24	26	24	27	17	26	81
1998	15	19	26	21	13	16	19	73
1999	19	27	32	21	27	18	29	84

Table 18

**NUMBER OF CHILDHOOD DEATHS (LESS THAN AGE 18) DUE
TO UNINTENTIONAL INJURIES, BY YEAR AND RACE (WITH
YEARLY AND THREE-YEAR AVERAGE PERCENTAGES)
TENNESSEE, 1997-1999**

	Race			Yearly Total
Years	White	Black	Other	
1997	174 (73.1%)	62 (26.1%)	2 (0.8%)	238
1998	161 (79.7%)	39 (19.3%)	2 (1.0%)	202
1999	178 (69.3%)	74 (28.8%)	5 (2.0%)	257
1997-1999	513 (73.6%)	175 (25.1%)	9 (1.3%)	697

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Figure 18

**NUMBER OF CHILDHOOD DEATHS (LESS THAN AGE 18)
DUE TO UNINTENTIONAL INJURIES, BY YEAR AND RACE
TENNESSEE, 1997-1999**
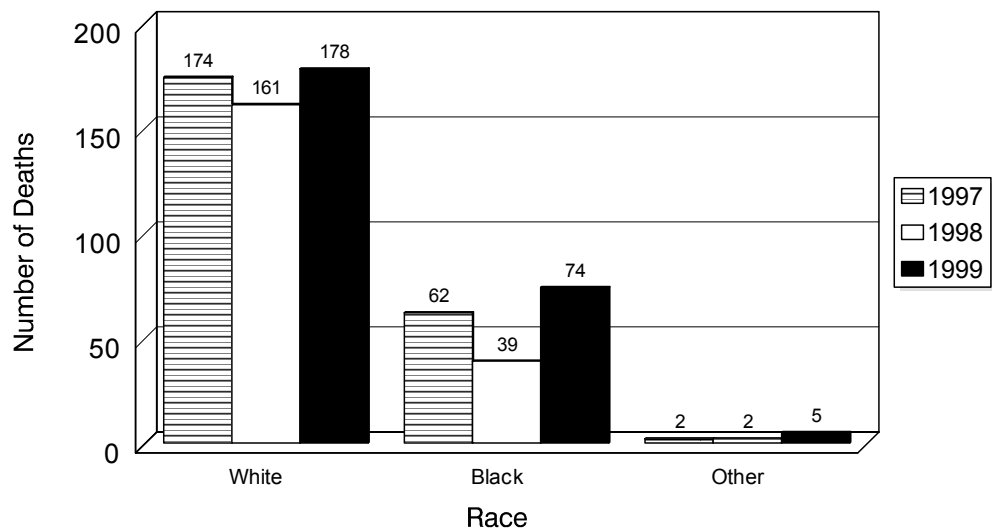

Table 19

**NUMBER OF CHILDHOOD DEATHS (LESS THAN AGE 18) DUE
TO UNINTENTIONAL INJURIES, BY YEAR AND GENDER
(WITH YEARLY AND THREE-YEAR AVERAGE PERCENTAGES)
TENNESSEE, 1997-1999**

	Gender		Yearly Total
Years	Male	Female	
1997	166 (69.8%)	72 (30.3%)	238
1998	131 (64.9%)	71 (35.2%)	202
1999	152 (59.1%)	105 (40.9%)	257
1997-1999	449 (64.4%)	248 (35.6%)	697

three-year period. Table 19 (page 25) and Figure 19 show the number and distribution of childhood unintentional deaths by gender. A chi-square two-way contingency table analysis was run on these data (chi-square=6.0851 with 2 d.f., and prob=0.0477), resulting in a statistically significant difference at the 0.05 level of significance. In observing the data in Table 19 (page 25) and Figure 19 the significant difference is probably due to a substantial increase in the number of female unintentional injury deaths in 1999. In 1997 and 1998 there were 72 and 71 female unintentional injuries deaths respectively. In 1999 there were 105 female unintentional injury deaths; a 46 percent increase in the number of deaths in this category.

Figure19
NUMBER OF CHILDHOOD DEATHS (LESS THAN AGE 18) DUE
TO UNINTENTIONAL INJURIES, BY YEAR AND GENDER
TENNESSEE 1997-1999
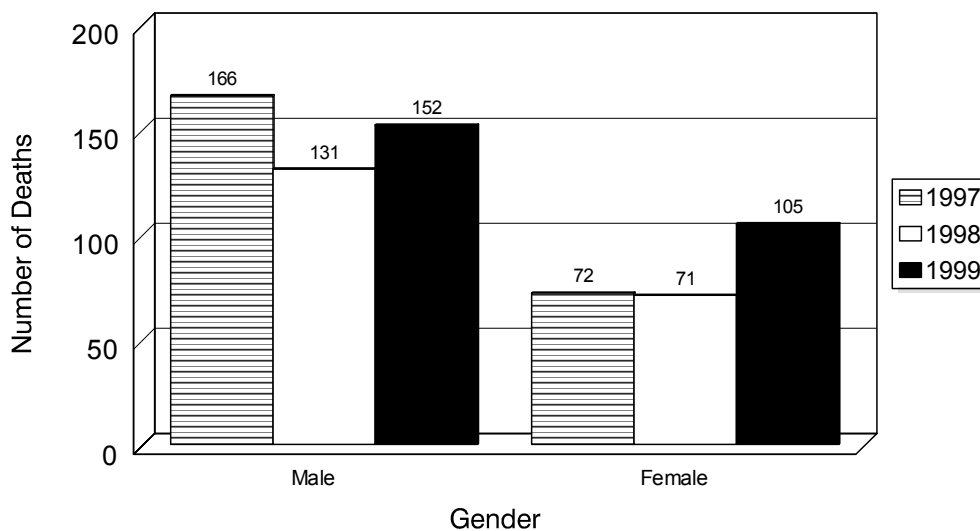
The increase in the number of female unintentional injury deaths warrants closer scrutiny. A more detailed look at female unintentional injuries deaths is in order. Table 20 and Figure 20 (page 27) show the number and distribution of female unintentional deaths by year and cause of injury over the three-year time period 1997-1999. The numerical values in Table 20 (page 27) are relatively low and can fluctuate widely due to random events; however, the data in this table hints that there appears to be a notable increase in the number of deaths that occurred in the vehicular and fire/burns cause of death categories in 1999. Female vehicular deaths went from 48 and 49 in 1997 and 1998 respectively, to 66 in 1999; and female fire/burn deaths went from 7 and 9 in 1997 and 1998 respectively, to 17 in 1999. Table 21 and Figure 21 (page 28) and Table 22 and Figure 22 (page 29) further breaks out female vehicular deaths by age group and race. Observation of these data indicate that a substantial part of the increase in female vehicular death occurred in the 16-17 year old demographic category, from 19 and 21 in 1997 and 1998 respectively, to 32 in 1999. No noticeable differences in the racial composition of female vehicular deaths over this period were ascertained. Table 23 and Figure 23 (page 30) and Table 24 and Figure 24 (page 31) show the distribution of Female Fire/Burn deaths by age group and racial composition. The numerical values are even further reduced to the point where any yearly change would be spurious. No major changes in the numerical values were noted.
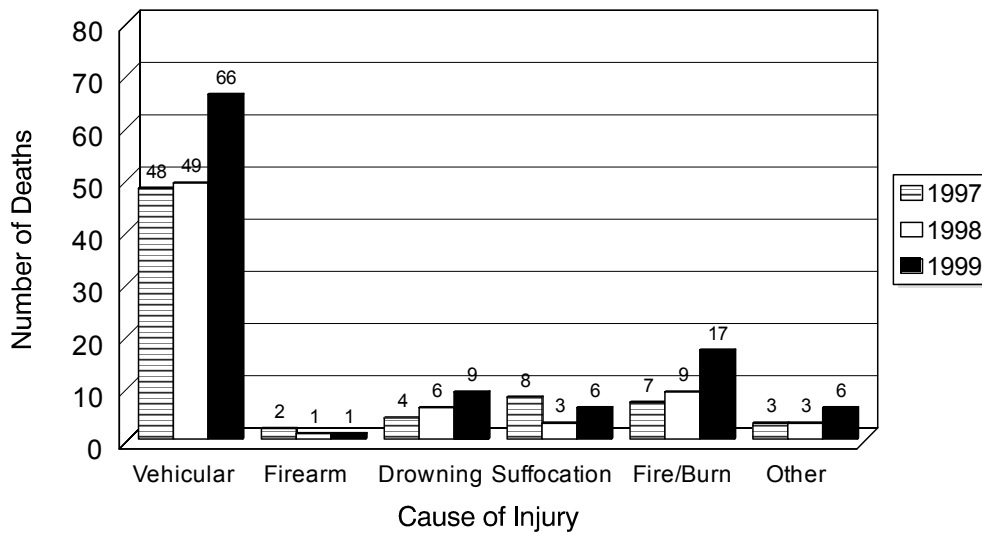
Table 20

**NUMBER OF FEMALE UNINTENTIONAL INJURY DEATHS
(LESS THAN AGE 18) BY YEAR AND CAUSE OF INJURY
(WITH YEARLY AND THREE-YEAR AVERAGE PERCENTAGES)
TENNESSEE, 1997-1999**

	Cause of Injury						
Years	**Vehicular**	**Firearm**	**Drowing**	**Suffocation**	**Fire/Burn**	**Other**	**Yearly Total**
1997	48 (66.7%)	2 (2.8%)	4 (5.6%)	8 (11.1%)	7 (9.7%)	3 (4.2%)	72
1998	49 (69.0%)	1 (1.4%)	6 (8.5%)	3 (4.2%)	9 (12.7%)	3 (4.2%)	71
1999	66 (62.9%)	1 (1.0%)	9 (8.6%)	6 (5.7%)	17 (16.2%)	6 (5.7%)	105
1997-1999	163 (65.7%)	4 (1.6%)	19 (7.7%)	17 (6.9%)	33 (13.3%)	12 (4.8%)	248

Figure 20

**NUMBER OF FEMALE UNINTENTIONAL INJURY DEATHS
(LESS THAN AGE 18) BY YEAR AND CAUSE OF INJURY
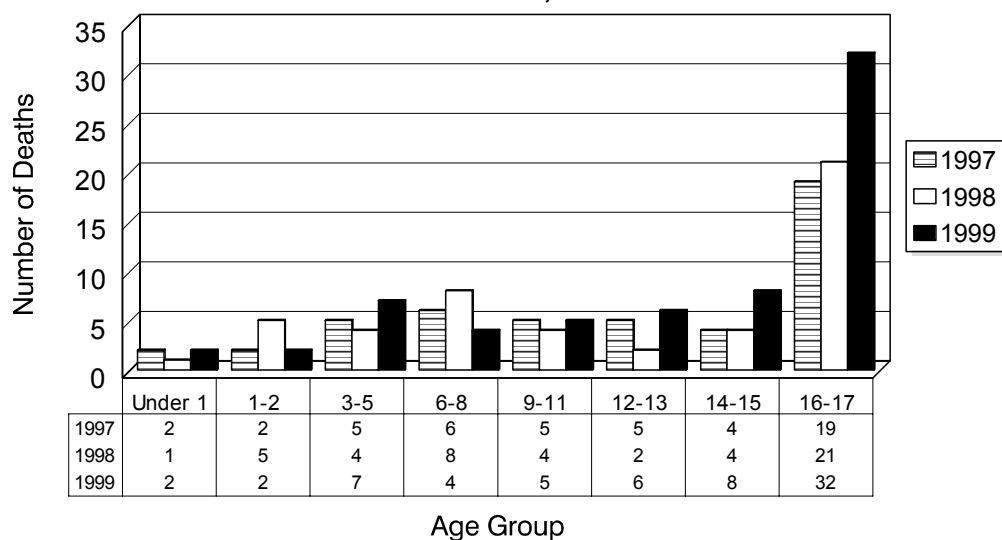TENNESSEE 1997-1999**

Table 21

**NUMBER OF FEMALE MOTOR VEHICLE DEATHS (LESS THAN AGE 18)
BY YEAR AND AGE GROUP (WITH YEARLY AND
THREE-YEAR AVERAGE PERCENTAGES)
TENNESSEE, 1997-1999**

				Age Group					
Years	Under 1	1 - 2	3 - 5	6 - 8	9 - 11	12 -13	14 -15	16 - 17	Yearly Total
1997	2 (4.2%)	2 (4.2%)	5 (10.4%)	6 (12.5%)	5 (10.4%)	5 (10.4%)	4 (8.3%)	19 (39.6%)	48
1998	1 (2.0%)	5 (10.2%)	4 (8.2%)	8 (16.3%)	4 (8.2%)	2 (4.1%)	4 (8.2%)	21 (42.9%)	49
1999	2 (3.0%)	2 (3.0%)	7 (10.6%)	4 (6.1%)	5 (7.6%)	6 (9.1%)	8 (12.1%)	32 (48.5%)	66
1997-1999	5 (3.1%)	9 (5.5%)	16 (9.8%)	18 (11.0%)	14 (8.6%)	13 (8.0%)	16 (9.8%)	72 (44.2%)	163

Figure 21

**NUMBER OF FEMALE MOTOR VEHICLE DEATHS
(LESS THAN AGE 18) BY YEAR AND AGE GROUP
TENNESSEE, 1997-1999**

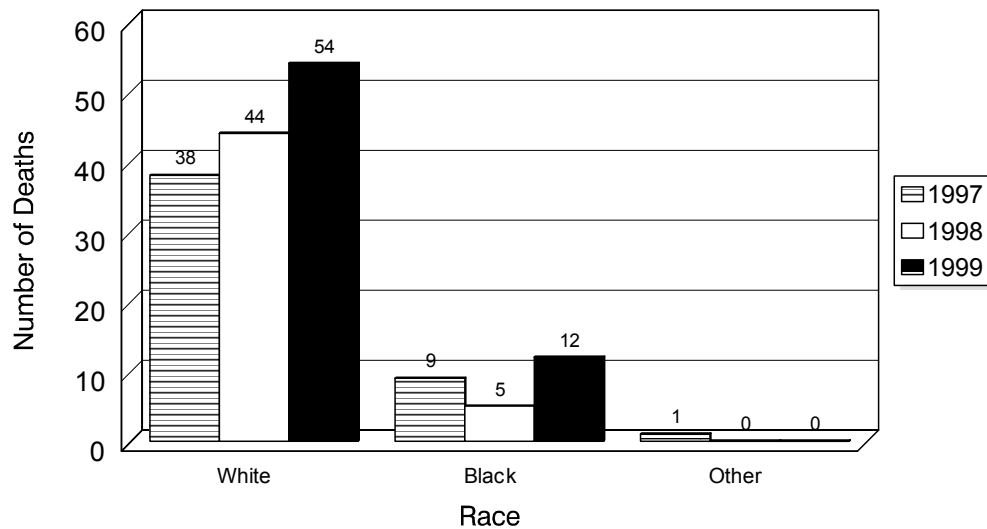|	Under 1	1-2	3-5	6-8	9-11	12-13	14-15	16-17
1997	2	2	5	6	5	5	4	19
1998	1	5	4	8	4	2	4	21
1999	2	2	7	4	5	6	8	32

28

Table 22

**NUMBER OF FEMALE MOTOR VEHICLE DEATHS (LESS
THAN AGE 18) BY YEAR AND RACE (WITH YEARLY
AND THREE-YEAR AVERAGE PERCENTAGES)
TENNESSEE, 1997-1999**

	Race			
Years	**White**	**Black**	**Other**	**Yearly Total**
1997	38 (79.2%)	9 (18.6%)	1 (2.1%)	48
1998	44 (89.8%)	5 (10.2%)	0 (0.0%)	49
1999	54 (81.8.%)	12 (18.2%)	0 (0.0%)	66
1997-1999	136 (83.4%)	26 (16.0%)	1 (0.6%)	163

Figure 22

**NUMBER OF FEMALE MOTOR VEHICLE DEATHS
(LESS THAN AGE 18) BY YEAR AND RACE
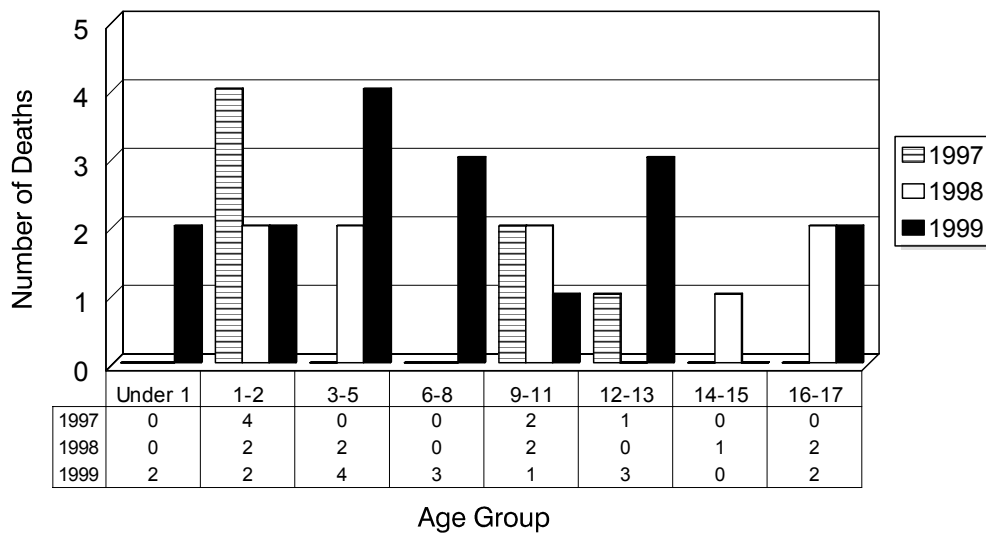TENNESSEE, 1997-1999**

Table 23

**NUMBER OF FEMALE FIRE/BURN DEATHS (LESS THAN AGE 18)
BY YEAR AND AGE GROUP (WITH YEARLY AND
THREE-YEAR AVERAGE PERCENTAGES)
TENNESSEE, 1997-1999**

				Age Group					
Years	Under 1	1 - 2	3 - 5	6 - 8	9 - 11	12 -13	14 -15	16 - 17	Yearly Total
1997	0 (0.0%)	4 (57.1%)	0 (0.0%)	0 (0.0%)	2 (28.6%)	1 (14.3%)	0 (0.0%)	0 (0.0%)	7
1998	0 (0.0%)	2 (22.2%)	2 (22.2%)	0 (0.0%)	2 (22.2%)	0 (0.0%)	1 (11.1%)	2 (22.2%)	9
1999	2 (11.8%)	2 (11.8%)	4 (23.5%)	3 (17.6%)	1 (5.9%)	3 (17.6%)	0 (0.0%)	2 (11.8%)	17
1997-1999	2 (6.1%)	8 (24.2%)	6 (18.2%)	3 (9.1%)	5 (15.2%)	4 (12.1%)	1 (3.0%)	4 (12.1%)	33

Figure 23

**NUMBER OF FEMALE FIRE/BURN DEATHS (LESS
THAN AGE 18) BY YEAR AND AGE GROUP
TENNESSEE, 1997-1999**

|	Under 1	1-2	3-5	6-8	9-11	12-13	14-15	16-17
1997	0	4	0	0	2	1	0	0
1998	0	2	2	0	2	0	1	2
1999	2	2	4	3	1	3	0	2

Age Group

30

Table 24

**NUMBER OF FEMALE FIRE/BURN DEATHS (LESS THAN
AGE 18) BY YEAR AND RACE (WITH YEARLY AND
THREE-YEAR AVERAGE PERCENTAGES)
TENNESSEE, 1997-1999**

	Race			
Years	**White**	**Black**	**Other**	**Yearly Total**
1997	3 (42.9%)	4 (57.1%)	0 (0.0%)	7
1998	4 (44.4%)	5 (55.6%)	0 (0.0%)	9
1999	6 (35.3.%)	9 (52.9%)	2 (11.8%)	17
1997-1999	13 (39.4%)	18 (54.5%)	2 (6.1%)	33

Figure 24
**NUMBER OF FEMALE FIRE/BURN DEATHS
(LESS THAN AGE 18) BY YEAR AND RACE
TENNESSEE, 1997-1999**

31
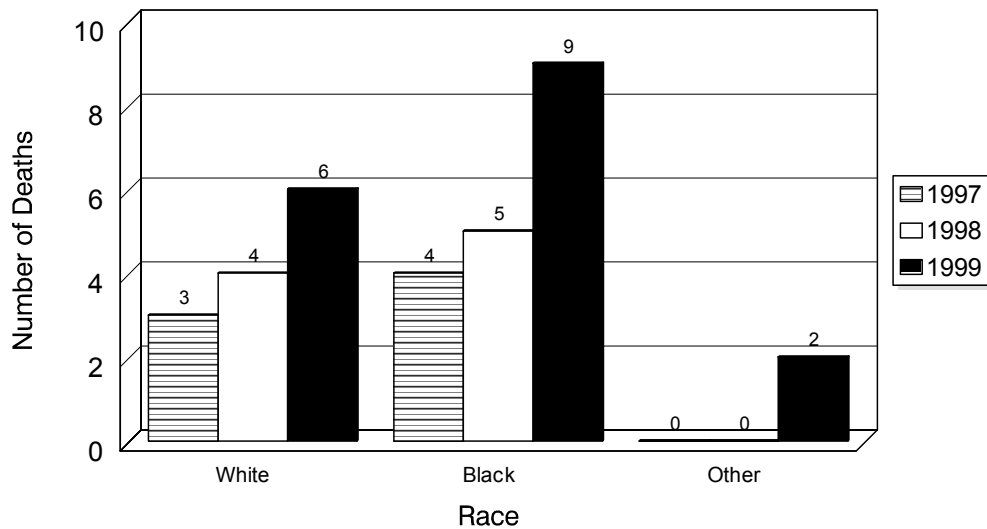
In summary it can be concluded that there appears to be no major change in the yearly number and distribution of childhood fatality unintentional injury deaths with the exception of a slight, statistically significant, increase in the number of female unintentional injury deaths in 1999. Most of this increase was in the 16-17 year old age group for vehicular deaths as well as a slight overall increase in the fire/burn cause of injury category, although the values are numerically small. No changes in the racial composition were discerned. Whether or not this slight increase is a true change or trend or is spurious is not certain at this point. These increases should be carefully monitored in subsequent years' data.

Childhood Violence Related Deaths

Violence related deaths are those determined by the Childhood Fatality Review Team to be either homicides or suicides. There were 68 violence deaths in 1997, 64 in 1998, and 69 in 1999. There has been little or no yearly change in the total number of violent deaths over the three-year period. Table 25 and Figure 25 (page 33) show the number and distribution of homicide and suicide deaths over the time period 1997-1999. A chi-square test was run on these data (chi-square=4.4186 with 2 d.f., and prob=0.1098), with a statistically insignificant result. While the number of violent deaths appear to fluctuate somewhat with respect to one another, the variation is due in a large part to the relatively low numerical values of the events. They simply do not meet the criterion of significance that we are using in this report. The yearly number and distribution of violent childhood deaths in Tennessee show no major pattern or trend over the three-year period. The data and analysis results for any one year are similar to the same for any other year.

Table 25

**NUMBER OF CHILDHOOD DEATHS (LESS THAN AGE 18) DUE TO
VIOLENT DEATHS, BY YEAR AND TYPE OF VIOLENT DEATH
(WITH YEARLY AND THREE-YEAR AVERAGE PERCENTAGES)
TENNESSEE, 1997-1999**

| | Type of Violent Death | | Yearly |
Years	Homicide	Suicide	Total
1997	41 (60.3%)	27 (39.7%)	68
1998	37 (57.8%)	27 (42.2%)	64
1999	51 (73.9%)	18 (26.1%)	69
1997-1999	129 (64.2%)	72 (35.8%)	201

Figure 25

NUMBER OF CHILDHOOD DEATHS (LESS THAN AGE 18) DUE TO VIOLENT DEATHS, BY YEAR AND TYPE OF VIOLENT DEATH TENNESSEE 1997-1999
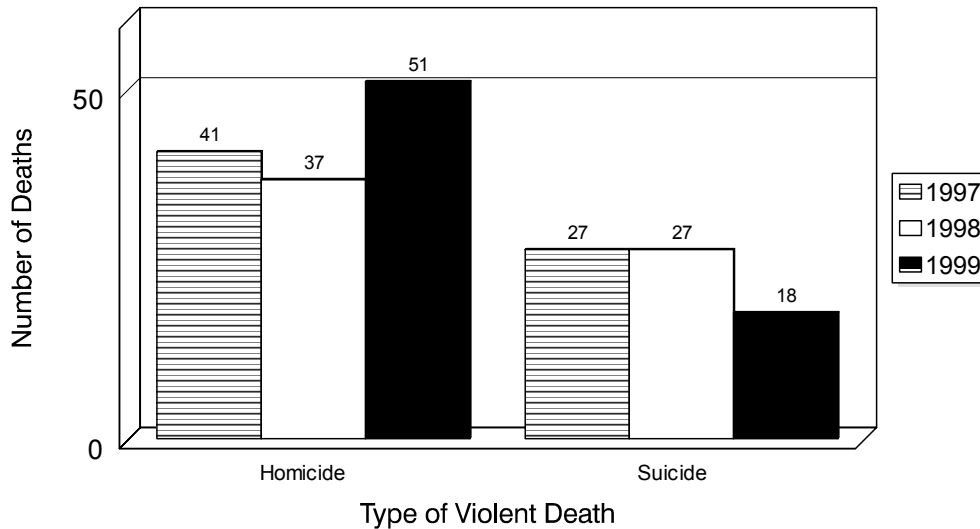
Childhood Homicide Deaths

There were 129 childhood deaths less than age 18 due to homicide during the three year time period 1997-1999, constituting a yearly average of 43 such fatalities per year. Table 26 and Figure 26 (page 34) show the number and distribution of childhood homicide deaths by year and age group over the three-year period. A chi-square two-way contingency table analysis was run on these data (chi-square=8.8232 with 14 d.f., and prob=0.8422), indicating that there appears to be no yearly trend in the number and distribution of homicide deaths by age group over the three-year period. Table 27 and Figure 27 (page 35) show the number and distribution of childhood homicide deaths by year and race of decedent over the three-year period. A chi-square two-way contingency table analysis was run on these data (chi-square=7.1990 with 4 d.f., and prob=0.1257), indicating that there appears to be no yearly trend in the number and distribution of homicide deaths by race over the three-year period. Table 28 and Figure 28 (page 36) show the number and distribution of childhood homicide deaths by gender for 1997-1999. A chi-square two-way contingency table analysis was run on these data (chi-square=0.0782 with 2 d.f., and prob=0.9617); again a non-statistically significant result. It can be concluded that there has been little or no yearly change in the number and distribution of childhood homicides in the demographic characteristics described. The problem of childhood homicide deaths from 1997 through 1999 has been fairly consistent over the three-year period.
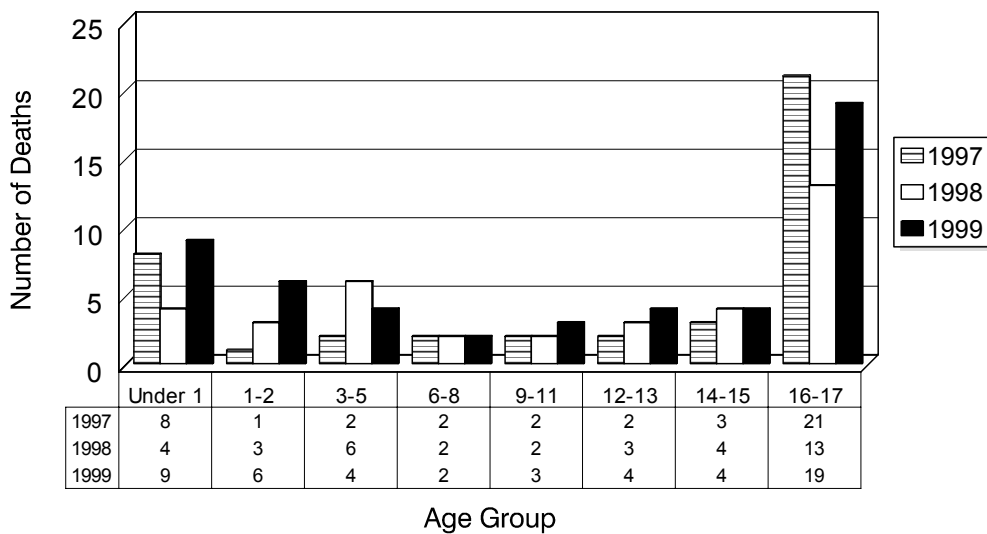
Table 26

NUMBER OF CHILDHOOD DEATHS (LESS THAN AGE 18) DUE TO HOMICIDE BY YEAR AND AGE GROUP (WITH YEARLY AND THREE-YEAR AVERAGE PERCENTAGES) TENNESSEE, 1997-1999

Years	Age Group Under 1	1 - 2	3 - 5	6 - 8	9 - 11	12 -13	14 -15	16 - 17	Yearly Total
1997	8 (19.5%)	1 (2.4%)	2 (4.9%)	2 (4.9%)	2 (4.9%)	2 (4.9%)	3 (7.3%)	21 (51.2%)	41
1998	4 (10.8%)	3 (8.1%)	6 (16.2%)	2 (5.4%)	2 (5.4%)	3 (8.1%)	4 (10.8%)	13 (35.1%)	37
1999	9 (17.7%)	6 (11.8%)	4 (7.8%)	2 (3.9%)	3 (5.9%)	4 (7.8%)	4 (7.8%)	19 (37.3%)	51
1997-1999	21 (16.3%)	10 (7.8%)	12 (9.3%)	6 (4.7%)	7 (5.4%)	9 (7.0%)	11 (8.5%)	53 (41.1%)	129

Figure 26

NUMBER OF CHILDHOOD DEATHS (LESS THAN AGE 18) DUE TO HOMICIDE, BY YEAR AND AGE GROUP TENNESSEE, 1997-1999

|	Under 1	1-2	3-5	6-8	9-11	12-13	14-15	16-17
1997	8	1	2	2	2	2	3	21
1998	4	3	6	2	2	3	4	13
1999	9	6	4	2	3	4	4	19

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Table 27

**NUMBER OF CHILDHOOD DEATHS (LESS THAN AGE 18) DUE
TO HOMICIDE, BY YEAR AND RACE (WITH YEARLY
AND THREE-YEAR AVERAGE PERCENTAGES)
TENNESSEE, 1997-1999**

| | Race | | | |
Years	White	Black	Other	Yearly Total
1997	12 (29.3%)	25 (61.0%)	4 (9.8%)	41 .
1998	17 (46.0%)	20 (54.1%)	0 (0.0%)	37
1999	20 (39.2%)	30 (58.8%)	1 (2.0%)	51
1997-1999	49 (38.0%)	75 (58.1%)	5 (3.9%)	129

Figure 27
**NUMBER OF CHILDHOOD DEATHS (LESS THAN AGE 18)
DUE TO HOMICIDE, BY YEAR AND RACE
TENNESSEE, 1997-1999**
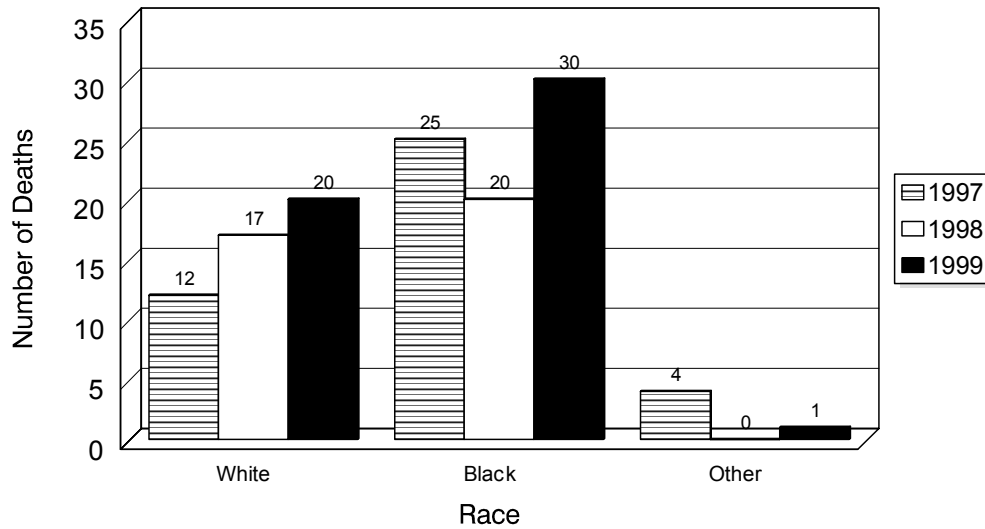
Table 28

**NUMBER OF CHILDHOOD DEATHS (LESS THAN AGE 18) DUE
TO HOMICIDE, BY YEAR AND GENDER (WITH YEARLY
AND THREE-YEAR AVERAGE PERCENTAGES)
TENNESSEE, 1997-1999**

	Gender		Yearly Total
Years	Male	Female	
1997	27 (65.9%)	14 (34.2%)	41
1998	25 (67.6%)	12 (32.4%)	37
1999	33 (64.7%)	18 (35.3%)	51
1997-1999	85 (65.9%)	44 (34.1%)	129

Figure 28
**NUMBER OF CHILDHOOD DEATHS (LESS THAN AGE 18)
DUE TO HOMICIDE, BY YEAR AND GENDER
TENNESSEE 1997-1999**

36
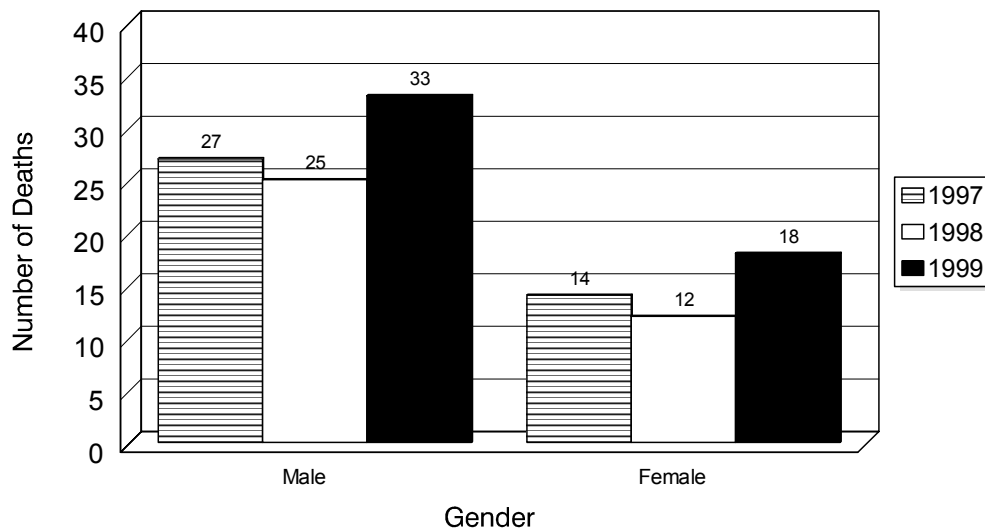
Three-year aggregate data merely enhances the findings in the individual reports for each of these years. The likelihood of a child being killed by homicide is greatest in the oldest age group of 16-17 years old. A yearly average of 18 (41 percent) of childhood deaths occurred in this age category. More males than females were killed by homicide, a yearly average of 28 (66 percent) male homicide deaths compared to a yearly average of 15 (34 percent) female homicide deaths. Black children were more likely to die by homicide than white children. A yearly average of 25 (58 percent) childhood homicide deaths occurred to black children compared to a yearly average of 16 (38 percent) deaths occurring to white children. Even the numerical difference belies the intensity of this difference. Since black children age 0 to 17 comprise 21 percent of all children in this age cohort, the likelihood of a black child dying from homicide is 5.4 times as great as his or her white counterpart. Thus any intervention program addressing childhood homicide deaths should keep black, male, older adolescent children in its focus.

Childhood Suicide Deaths

There were 72 childhood suicide deaths during the years 1997-1999 or an average of 24 per year. While this number of childhood deaths is relatively low compared to the overall number of childhood deaths, it is of greater concern in the sense that all of these deaths should be preventable. While further demographic breakout of this death is feasible and enlightening, due to the low number of cases involved, any statistical significance testing may methodologically have limited validity. Hence no further testing was attempted; only descriptive observations are made. Table 29 and Figure 29 (page 38) show the number and distribution of these childhood suicide deaths by year and age group over the three-year period. As would be expected, the majority of deaths over the three-year period, 41 or 56.9 percent, occurred in the older adolescent cohort, 16-17 years of age. The next highest age group was the group, 14-15 years of age with 23 or 31.9 percent of childhood suicide deaths. Three children ages 9-11, committed suicide during the time period of this report. Table 30 and Figure 30 (page 39) show the number and distribution of childhood suicide deaths by year and gender over the three-year period. The majority of such deaths, 59 or 81.9 percent, occurred to male children. Only 13, or 18.1 percent, occurred to female children. Table 31 and Figure 31 (page 40) show the number and distribution of childhood suicide deaths by year and race over the three-year period. The majority of these deaths, 64 or 88.9 percent, occurred to white children. Only 6, or 8.3 percent, occurred to black children. This difference was not only numeric but proportional as well. Since white children compose about 74 percent of the less than age 18 population and black children compose about 21 percent of the same population, white childhood deaths due to suicides occur at a rate that is 3 times as great as their black counterparts. In summary three year childhood suicide deaths in Tennessee for 1997-1999 indicate that it is most predominant demographically in the white, male, older adolescent subgroup. Any intervention program should keep this group in its focus.
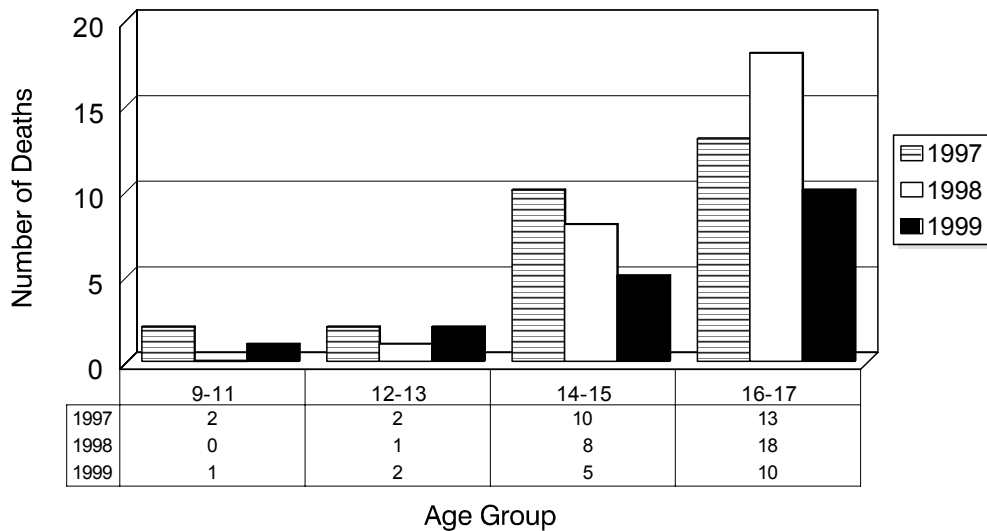
Table 29

**NUMBER OF CHILDHOOD DEATHS (LESS THAN AGE 18) DUE
TO SUICIDE, BY YEAR AND AGE GROUP (WITH YEARLY
AND THREE-YEAR AVERAGE PERCENTAGES)
TENNESSEE, 1997-1999**

	Age Group				
Years	9-11	12-13	14-15	16-17	Yearly Total
1997	2 (7.4%)	2 (7.4%)	10 (37.0%)	13 (48.2%)	27
1998	0 (0.0%)	1 (3.7%)	8 (29.6%)	18 (66.7%)	27
1999	1 (5.6%)	2 (11.1%)	5 (27.8%)	10 (55.6%)	18
1997-1999	3 (4.2%)	5 (6.9%)	23 (31.9%)	41 (56.9%)	72

Figure 29

**NUMBER OF CHILDHOOD DEATHS (LESS THAN AGE 18)
DUE TO SUICIDE, BY YEAR AND AGE GROUP
TENNESSEE, 1997-1999**

|	9-11	12-13	14-15	16-17
1997	2	2	10	13
1998	0	1	8	18
1999	1	2	5	10

Age Group

38

Table 30

**NUMBER OF CHILDHOOD DEATHS (LESS THAN AGE 18) DUE
TO SUICIDE, BY YEAR AND GENDER (WITH YEARLY
AND THREE-YEAR AVERAGE PERCENTAGES)
TENNESSEE, 1997-1999**

	Gender		Yearly Total
Years	Male	Female	
1997	23 (85.2%)	4 (14.8%)	27
1998	20 (74.1%)	7 (25.9%)	27
1999	16 (88.9%)	2 (11.1%)	18
1997-1999	59 (81.9%)	13 (18.1%)	72

Figure 30

**NUMBER OF CHILDHOOD DEATHS (LESS THAN AGE 18)
DUE TO SUICIDE, BY YEAR AND GENDER
TENNESSEE 1997-1999**
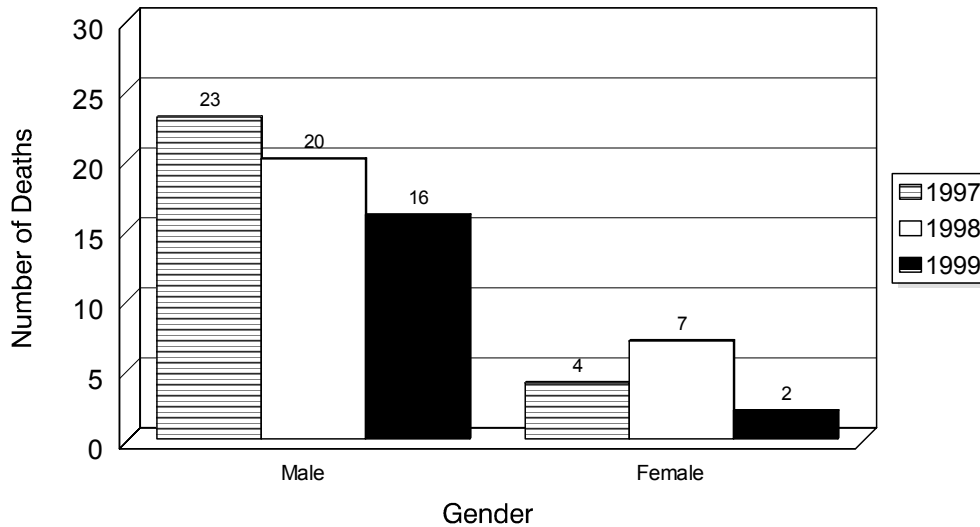
Table 31

**NUMBER OF CHILDHOOD DEATHS (LESS THAN AGE 18) DUE
TO SUICIDE, BY YEAR AND RACE (WITH YEARLY
AND THREE-YEAR AVERAGE PERCENTAGES)
TENNESSEE, 1997-1999**

Years	Race			Yearly Total
	White	Black	Other	
1997	23	4	0	27
	(85.2%)	(14.8%)	(0.0%)	.
1998	23	2	2	27
	(85.2%)	(7.4%)	(7.4%)	
1999	18	0	0	18
	(100.0%)	(0.0%)	(0.0%)	
1997-1999	64	6	2	72
	(88.9%)	(8.3%)	(2.8%)	

Figure 31
**NUMBER OF CHILDHOOD DEATHS (LESS THAN AGE 18)
DUE TO SUICIDE, BY YEAR AND RACE
TENNESSEE, 1997-1999**

40
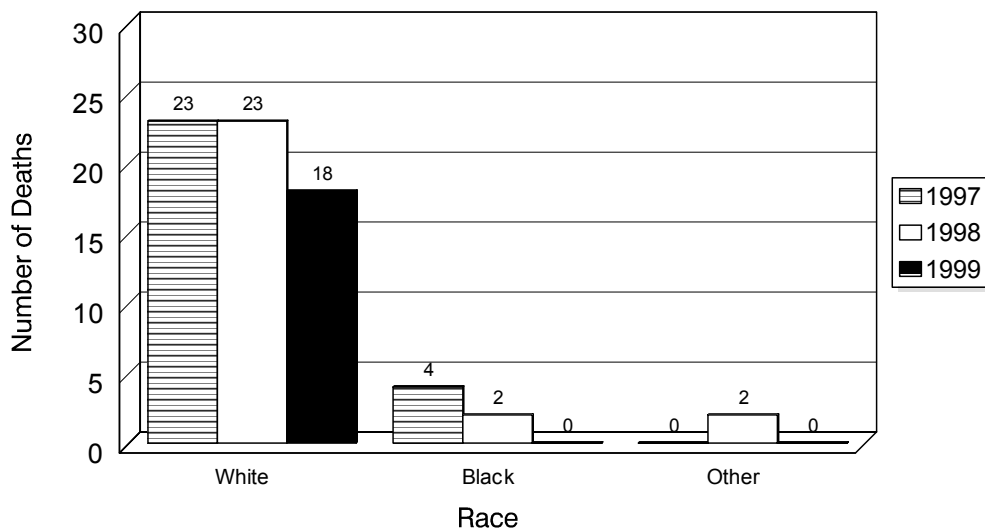
Summary and Conclusions

The 'Child Fatality Review and Prevention program has been in existence in Tennessee since 1995. Over that time period, the program has reviewed nearly all childhood deaths in Tennessee, developed a database on the deaths, described and analyzed the nature and background of the deaths, and published four annual reports for the years 1996 through 1999. Detailed information and discussions of these deaths can be found in the reports for the individual years. The procedures and methods of childhood fatality review and the data collection content and format now appear to be well established and stable. It was thus felt that a multiyear review of the data over a larger current time period would be appropriate at this point. The time period chosen for this multiyear review was 1997-1999, the last three years of available data. Review and analysis of this larger pool of data should provide for a higher level of reliability of any results obtained and a greater certainty of any findings and conclusions so derived. The purpose of this review was not to concentrate on the detail presented in the previous years' reports. Nor was it primarily directed to describe the major manner of death categories of childhood deaths in relation to the demographic characteristics associated with them, although such relationships are described in the analysis and are part of the analysis. Rather, the main thrust of this study was to discern, in a gross state aggregate sense, if any of the yearly differences in the number and composition of these deaths by these characteristics were indeed out of the ordinary and notable, and not due to normal random variation. Such a synopsis should help highlight one of two situations: it should either enhance and corroborate any findings of individual years and verify whether or not they are valid and consistent over time; or it should also note any changes or trends that might be developing in childhood mortality that might be of concern and need to be addressed. The pooled data should also provide for a greater reliability and precision in many of the measures calculated. In this three-year analysis, chi-square contingency tables statistical significance tests were employed to determine if the differences noted were based upon scientific merit and rigor.

The results of these statistical tests for significant differences are extremely important and should not be overlooked. With one exception, what is implied from a global perspective, is in the time period of this report, 1997-1999, there has been virtually no yearly change in the gross numbers or distributions of childhood deaths by either manner of death or the demographic characteristics of age, race, and gender. The one exception was that female childhood unintentional injury deaths seemed to be somewhat elevated in 1999. The increase is due in a large measure to an increase in white female unintentional injury deaths. While the increase was statistically significant at the 0.05 level of significance, the actual increase was relatively small in terms of the overall number of childhood deaths. The category needs further monitoring in future data analyses. Otherwise, any changes in the actual values of the numbers of deaths and their percent distributions can be characterized as being both minor and random. No other major changes or trends could be ascertained in the aggregate data. The phenomenon of childhood deaths in Tennessee thus appears to be in a yearly 'steady-state' condition. A statistical description of the composition or profile of childhood deaths for one year is very similar to any other year during the three-year period. The observations from these three years of data should have a great import in assessing the underlying conditions related to the problem of childhood deaths in Tennessee. First, the three years of data indicate that the methods of data collection, classification, and analysis have been consistent over the three-year period. Secondly, since the results of each year corroborate very well with each other, confidence in the measurement techniques, methodology employed, and the conclusions reached are greatly enhanced. Thirdly, and most importantly in developing public health policy and programs to address the issue of reducing childhood deaths in Tennessee, it is important to know that one is looking at a fairly well-defined, stable, recurring problem. The characteristics surrounding childhood deaths in

Tennessee are not changing; they are not moving targets. Policies and procedures aimed at alleviating and reducing this problem can be viewed with more confidence and efficacy in achieving their desired results. From the data and analyses the broad overall findings of this study of childhood deaths in Tennessee over the three-year period 1997-1999 can be described as follows:

The number of childhood deaths in Tennessee is currently fluctuating at values that are slightly more than a thousand on an annual basis. The manner of death has remained fairly constant over the three-year period with natural causes constituting the majority of childhood deaths. Approximately 70 percent of all childhood deaths were attributed to this category. The next major cause of death was unintentional injuries at 22 percent of the deaths. Violence related deaths followed at 6 percent of the deaths. The composition or distribution of childhood deaths in Tennessee, by manner of death, is a very important factor for consideration in developing public health strategies to prevent or reduce these deaths. The nature and background of contributing factors surrounding these manners of death are somewhat different from one another, and as such, will require a different intervention approach in any successful program or programs to reduce these deaths. This composition or distribution poses somewhat of a paradox in addressing the problem of childhood deaths. The manner of death which composes the largest number of childhood deaths, and hence where the most progress in reducing these deaths could be made, is natural causes. It is, however, to a large degree dependant on the nature of the 'human condition' and the limitations of our medical and scientific advancements at this point in time. While the manner of death which, theoretically, is completely avoidable and which has the greatest potential for intervention and reduction, violence related death, composes the smallest number of childhood deaths. Policymakers need to keep this perspective in mind as they address and allocate resources to these issues.

The majority of childhood deaths, 57 percent, occurred to infants under 1 year of age. These deaths are highly correlated to natural causes and prematurity and perinatal issues. The number and percentage of deaths drop throughout early childhood until early adolescence when they start to increase in the unintentional injuries and violence manner of death categories. The latter childhood death age category, 16-17 years of age, has the second highest number and percentage of all childhood deaths, 12 percent of the deaths. Gender differences in the distribution of total childhood deaths have been 58 percent male and 42 percent female. Racial differences have run 61 percent white and 36 percent black. However, this is based upon the total number of deaths and does not account for the differences in the racial composition of the population at risk and does not give a complete and accurate depiction of the intensity of the difference due to this demographic factor. Black childhood deaths occur at a rate that is about 2.1 times as great as the rate for their white counterparts. Childhood deaths in Tennessee vary greatly, both by number and intensity, according to the manner of death and the demographic characteristics of age group, gender, and race. More detailed breakdowns and discussions of these characteristics can to be found in the body of this report and in the reports for the individual years 1997-1999. Similar analyses of future years data should further contribute to these findings and conclusions.